THE SOUTHERN PLANTER

Devoted to Agriculture, Horticulture, and the Household Arts.

Agriculture is the nursing mother of the Arts. [XENOPHON.

Tillage and Pasturage are the two breasts of the State.—SULLY.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

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An Address.

Delivered at the 8th Session of the American Pomological Society, held in Philadelphia, Pa., Sept. 11th, 12th and 13th, 1860.

BY MARSHAL P. WELDER, PRESIDENT.

Gentlemen of the Society, and Friends of American Pomology:

By our Constitution, my official position requires me, at the opening of this session, to address you on the art or science of pomology, on the interests, progress, and present condition of our association.

In the performance of this duty I am happy to meet you in this city of brotherly love, the birthplace of that Declaration which gave us an independent national existence; of that Constitution also, which embodies the wisdom of our venerable fathers, and is the charter by which we hold the inheritance we seek to improve, enjoy, and transmit. Here, too, by a former inhabitant of Philadelphia,* a few years later, was first exhibited the application to vessels of that invisible agent, which now propels thousands of steamers through our navigable waters, which has wrought such wonders in all the useful arts of life, and is progressing upon a stupendous scale of development. Here was organized the first society for the promotion of American Agriculture. Here, also, originated the first association for the advancement of American Horticulture, having, for one of its leading objects, the introduction and cultivation of new and choice varieties of fruit.

Most of the venerable men who were the authors of these institutions, the founders of these civil and social compacts, have fulfilled their earthly mission; but the enterprises which they inaugurated continue, diffusing, through the land and the world, the blessings of progressive art, of rural life, of social order, of civil liberty. These fathers have fallen in the great battle of life; and since our last biennial session, others, more intimately associated with us in our favorite pursuits, have passed away never to return. Two of the founders of the society, who have occupied official positions from its formation, will meet with us no more.

DECEASED OFFICERS.

Andrew H. Ernst, of Cincinnati, Ohio, one of the Vice Presidents of this society, died at his residence in that city, February 13th, 1860, aged sixty-four years. He was a gentleman of foreign birth, but thoroughly nationalized; being a great admirer of American character, and a firm supporter of

* John Fitch, in 1788. To his steamboat Perseverance.

American institutions. He was a pioneer and champion of our cause in the northwest section of our country; a gentleman favorably known and highly appreciated by all who knew him for his pomological knowledge, for his characteristic modesty, for suavity of manner, and for his eminent Christian virtues.

We have also to mourn the death of Benjamin V. French, of Dorchester, Massachusetts, a member of the Executive Committee, who died April 10th, 1860, aged sixty-eight years. Mr. French was ardently devoted to the cause of terra-culture, in its most comprehensive sense, and has, for many years, held important official positions in the Agricultural and Horticultural Societies of his State and country. Few men have been more interested in the cultivation of the soil, and few have been so strongly attached to rural life and rural happiness. Even to the close of life, these were his most cherished objects.

In reflecting on the usefulness and example of our departed friends, on their labors and contributions to the cause of pomology, their honorable life and peaceful death, we shall ever retain a high appreciation of their worth. We cheerfully accord to their memory our gratitude for their valuable services, and enrol their names among the benefactors of mankind. We mourn the loss of these worthy associates, but our institution still lives, and other friends survive to coöperate with us in advancing the cause so dear to our hearts.

EIGHTH SESSION.

This is the eighth session and twelfth year of our association. Much has been accomplished since its organization, but how wonderful the improvement in every branch of husbandry, and in all that concerns the progress of society since the formation, in this city, of the first association for the promotion of rural art, just three quarters of a century ago! It is profitable to look back occasionally, and see what has been achieved in the past.

Most sincerely do I congratulate you upon the general interest now awakened in fruit culture—on the zeal, enterprise, and industry of cultivators in the acquisition and production of new and choice varieties—on the multiplication of local associations and publications, all laboring with us for the promotion of pomology.

In this presence, and on this occasion, I have no speculations or doubtful theories to promulgate. We have had already enough, and perhaps too many of these for our own benefit or others. What we especially need, are the results of the ripe and united experience of the best cultivators, guided by the deductions of science. Some of the recommendations in former addresses I desire to reinforce, for it is "line upon line, and precept upon precept," that makes a deep and lasting impression. New topics, as they arise, are entitled to respectful consideration, and the discussion of them will undoubtedly elicit important information.

REVISION OF CATALOGUE.

It has been our custom on former occasions to enlarge and revise our General Catalogue by a discussion and vote on each variety. Great advantage has already resulted to the country, and to the world, from the catalogue of this Society, which classifies our fruits, registers those suited to general cultivation; those adapted to particular localities; those which promise well; and those that are pronounced unworthy of cultivation.

It will be remembered that, at the last biennial session, the Chairman of the General Fruit Committee recommended the appointment of local committees in each State and Territory, charged with the duty of producing and submitting to a special committee a list of the fruits cultivated in their respective localities.

From these local catalogues, embodying the ripest experience of the best cultivators in all parts of the country, it will be easy for the society, at its next session, to transfer fruits to the corresponding department of the Society's General Catalogue.

I therefore respectfully recommend,

First, That no revision of that portion of our catalogue embracing fruits for general cultivation be attempted at this meeting.

Secondly, That local committees be appointed, each of which shall be charged with the duty of preparing a catalogue of the fruits in its own locality, on the same general plan as the Society's Catalogue.

Thirdly, That a special committee be appointed at this time, to whom these various local committees shall make their report during the year 1861.

Fourthly, That the Special Committee be charged with the duty of compiling, from

these local catalogues, and from the present catalogue of our Society, full lists of all the fruits therein named, properly classified and arranged, with due regard to nomenclature and terminology, and shall submit the same at the next biennial session for its consideration and action. This labor, well performed, will redound to the honor of American Pomology.

These recommendations are not intended to preclude a discussion of the merits or demerits of any variety now on our catalogue. On the contrary, they call for a full and free expression of opinions in respect to any department of the same, as this may aid the labors of the several committees. Neither are they intended to preclude the addition of varieties to the list which *promise well.*

If this association had rendered no other service except to give to the world its present catalogue of fruits, it would have fulfilled an important mission; but it has done more; it has encouraged and originated many kindred associations, has brought together experienced cultivators, and made them teachers of each other.

By this action and reäction of mind on mind, many of the first principles of judicious cultivation are now fully settled and well understood. Among these are the following, to which I will now only briefly allude, as they have been more fully considered in former addresses:

CULTURE OF TREES.

1. The healthful development of fruit trees, as of other living substances, depends on the regular reception of a certain quantity of appropriate food. This food, whether derived from the earth, air, water, or other natural elements, is conveyed through the medium of the atmosphere and the soil. While we have only an indirect and imperfect control of the atmosphere and other meteorological agents, the Great Arbiter of Nature has committed the *soil* directly to our care and treatment.

2. To this I may add the general sentiment in favor of thorough and perfect drainage, beneficial to all cultivators, but indispensable to the fruit-grower.

3. Not less uniform is the experience of the salutary effects of a proper preparation of the soil for fruit-trees, both in the nursery and in the orchard.

These principles are settled in the minds of all intelligent fruit-growers; but they need to be often promulgated and enforced. It should be equally well understood that success depends upon the adaptation of the habits of the tree to the constituents of the soil, the location, and aspect or exposure. A disregard of this principle, and the fickleness of seasons, are among the most common causes of failure, not only among inexperienced cultivators, but among professed pomologists.

More attention should be given not only to the location, but especially the aspect of trees. A common error is to disregard the time of ripening. We plant our early fruits in the warmest and most genial locations. These should be assigned to our latest varieties. For instance, we, at the north, have too often placed our late fall and winter pears, like Easter Beurré, or Beurré d'Aremberg, in northern aspects and exposed positions, where they are liable to injury by the gales and frosts of autumn, whereas we should have given them a southern aspect, and our most fertile soils, to bring them to perfection. The most favorable locations are not so indispensable to our summer fruits, which mature early under the more direct rays of the sun, and in a much higher temperature. This rule may require modification, and even reversion, to adapt it to the south or southwest portion of our county. And here I cannot refrain from expressing the earnest hope that our local catalogues may be framed with a wise reference to this principle, and that the day may not be distant when the Society's Catalogue shall designate the particular locality, aspect, and soil, adapted to each variety of fruit.

But however important these considerations may be, the subsequent cultivation of trees must receive a passing notice, even at the risk of repeating some opinions of myself and others, which are already before the public.

The sentiments contained in the communication of Mr. J. J. Thomas, at our last session, against the growth of any other crop in orchards, especially against relying upon small circles dug around trees in grass ground, as a method of culture, deserves to be held in perpetual remembrance. Equally injurious, in my own opinion, is the habit of deep digging or ploughing among fruit trees, thereby cutting off the roots, and destroying the fibrous feeders, which frequently extend beyond the sweep of the branches. However necessary the practice may be of

cutting off roots in old orchards, in the process of renovation, it should be carefully avoided in grounds properly prepared, and where the trees are in a healthy or bearing condition. From experiment and observation, I am persuaded that working the soil among fruit trees, to the depth of more than three or four inches, should be carefully avoided. The surface should only be worked with a hoe, or scarifier, for the purpose of stirring the soil, and keeping out the weeds. Thus we avail ourselves of the advantages of what, in farming, is called flat-culture, at present so popular. For the same reason, manure should not be dug in to any considerable depth, and some of our wisest cultivators now recommend its application on the surface. So favorably impressed with this practice is the Massachusetts Board of Agriculture, that it has ordered a series of experiments with cereal grains and other products in the application of manures on the surface as compared with specified depths beneath it.

The practice of surface manuring is no novelty of our day. An eminent cultivator of fruits, nearly two hundred years ago, said, "Manures should be applied to fruit trees in the autumn upon the surface, that the rains, snow, and frosts may convey the elements of fertility to the roots;" and "that, by this method, one load will do more good than two used in the common way of trenching in to the depth of one foot." Other distinguished cultivators and scientific gentlemen recommend the same practice. Hence we are of opinion that our orchards and gardens should be manured in the autumn, and on the surface, so that the manures may be thoroughly decomposed, made soluble during the fall and winter, and suitable for the nourishment of the tree early in the spring.

In the history of this art, as of most others, it is wonderful how human opinions change. What were once considered as fundamental, are now rejected as unphilosophical or injurious, and those once rejected are now adopted as wise maxims. The doctrine has prevailed, from the time of Columella and Varro, that manures should not be exposed to the air, but should be incorporated with the soil as soon as laid out; whereas, we have now the opinion of cultivators and chemists in favor of exposure to the air and other external agents of decomposition, and that it is not a source of nutrition to the plant until it is thoroughly decomposed. This opinion is certainly corroborated by the practice of skilful gardeners in all past time, who will never use green manure in the potting or cultivation of plants, and only that which has become old and fine.

NEW NATIVE FRUITS.

Changes of opinion have also taken place in regard to the acquisition of new sorts of fruits. Formerly we looked to other countries; now we rely more especially on our own seedlings for the best results. When we reflect upon the great number of new varieties which have, in our time, been raised from seed, and the progress which has thereby been made, no apology need be offered for repeating what has been said in former addresses in commendation of this branch of pomology. It was my first, so it shall be my continual and last advice: "*Plant the most mature and perfect seed of the most hardy, vigorous, and valuable varieties, and, as a shorter process, ensuring more certain and happy results, cross or hybridize your best fruits.*"

What wonders this art has already accomplished in the production of new and improved varieties in the vegetable kingdom! How much it has done for the potato, the turnip, and other vegetables,—producing, from a parent stock of inferior grade, numberless varieties of great excellence! How it has brought forth, from the hard, acrid, and foxy grape of the woods, the delicious varieties that are now obtaining notoriety and extension; from the bitter almond, the luscious peach and nectarine; from the austere button-pear of the forest, the splendid varieties that command our admiration; from the sour crab, the magnificent apples which now constitute the dessert of our tables; from the wild raspberry and blackberry of the hedge, from the native strawberries of the pasture, those superb varieties which crown the tables at our exhibitions. We believe it is now admitted that our native varieties are more hardy, vigorous, productive, and free from disease than most foreign sorts. Thus we have seedling gooseberries free from mildew, and pears that never crack. Why can we not breed out the black wart from the plum? It has been suggested, by a gentleman of great knowledge, that, by taking the common wild plum, the *Prunus Americana*, of which

there are several varieties, varying in color, size, and flavor, we may produce kinds not subject to disease, if judiciously crossed with our best garden sorts; or, if bred between themselves, we might perhaps add new varieties to our species of cultivated plums, which would be healthy, productive, and delicious. This suggestion is certainly worthy of consideration and experiment.

Let not this recommendation, however, in regard to cross-fertilization, discourage the sowing of other seeds, because they have not been artificially impregnated by the hand of man, for they may have been fertilized by the wind, or insects conveying the pollen of one variety to the style of another. In this way have been produced most of the superior sorts of American fruits. How extensive and inviting is the field here opened even to the most common fruit grower, who, practising upon this principle through a series of years, can hardly fail to produce some good fruits, although he may not be acquainted with the higher and more delicate process of artificial impregnation. But infinitely superior and more promising is the sphere of enterprise which opens before the scientific pomologist. It is broad as the earth, free as the air, rich as the land of promise. In his hands are placed the means of continual progress without the numerous uncertainties which must ever attend accidental fertilization. He has the sure guide of science, which never misleads her votaries, but elevates them from one degree of excellence to another towards absolute perfection. By these processes, new varieties are multiplying with unparalleled rapidity throughout our country. We rejoice in the intense zeal which has been awakened in this pursuit. It augurs well for the future, whether prompted by the desire either of fortune or of fame. But the spirit of adventure, thus awakened, needs occasionally a little wholesome discipline, let it foster an undue reliance on immmature experience, and tend to quackery, imposition, and fraud.

While we refrain from all personal reflections, we cannot forbear exhorting all, and especially the officers and members of this association, to increased vigilance and caution in the recommendation of novelties, until they have been thoroughly tested by competent judges. As it is human to err, so it is natural to be partial to one's own offspring and friends, and this partiality often sways the judgment of honest and good men.

But a more common and serious difficulty under which we labor, is the promulgation of seedlings by individuals and associations that have not the information requisite to form an intelligent, and therefore reliable judgment. Another evil which increases with the mania for what is new and rare, is the exposure for sale, by flaming advertisements and speculating agents, of old varieties under new and specious names, varieties which, like Jonah's gourd, were known in their day and place, but have long been consigned to oblivion.

As in the past, so in the present and in the future, let it be our purpose and practice to reject those that are worthless, to withhold our approbation from those that are doubtful, and to encourage the multiplication of those only which are of decided and acknowledged worth. Thus shall we elevate the standard of judgment, and fulfil the mission providentially assigned us. We might enlarge on this and other topics, but the brief period which it is proper for me to occupy in this opening address, restricts me to one or two other considerations.

AFFINITIES.

I would here again recommend a more careful study of affinities between the stock and the graft. Whatever be the opinions in regard to the manner and degree of influence which the scion has upon the stock, or the reverse, the fact of that influence is undeniable. For example, we have seen certain varieties of the pear, as the Cross, Collins, and others, which would not readily assimilate with the stock, however vigorous. We have, in many instances, seen healthful trees sicken and eventually die, by the insertion of these uncongenial grafts. So great was the want of congeniality, that we have seen the stocks throw out successive crops of suckers, and although these were frequently removed, yet the scion would refuse to receive and elaborate the sap in sufficient quantity to nourish it, and the trees would finally die. In such instances, the only way to restore the health of the stock, is to remove the graft for a scion of its own or some other appropriate sort.

As I have formerly directed your attention to this topic, I have only space to embody a few general rules to guide practice.

In deciding upon affinity between the tree and graft, consider—

First, The character of the woods to be

united, as whether of fine or coarse texture, of slender or gross growth.

Second, The wood-buds, whether abundant or sparse, plump or lean, round or pointed.

Third, The seasons of maturity, whether early, medium, or late.

These suggestions will suffice to indicate the direction of thought and the kind of investigation to be pursued. A better knowledge of the subject will, no doubt, hereafter be attained, and will reveal some of the inexplicable mysteries which now attend this branch of fruit culture.

GRAPE CULTURE.

Let me for a moment call your attention to the cultivation of the grape. This is now assuming so much importance in our country that it seems entitled to special attention at this time. Its progress is indeed marvellous. Until within a few years, it was supposed that Providence had assigned grape-culture and the manufacture of wine to countries in the south of Europe, and that the soil and climate of America were not at all adapted to their production. Still later, the theory was promulgated, which has not as yet yielded in full to a more enlightened judgment, that no good grape could flourish on our eastern slope. Now it is known to succeed in almost every aspect where soil and cultivation are suitable, and it is believed that no country on earth is better adapted to the extensive cultivation of the grape than the United States of America. This branch of fruit-culture is yet in its incipient state, but it has progressed so far as to authorize the belief that the grape can be grown with success in almost every State and Territory of the Union.

With the progress already made in raising new sorts, it is only a question of time when we shall have varieties adapted to almost every locality. Thousands of cultivators, scattered over our extended country, are each of them raising new varieties from seed in the expectation of success. While some of them may be valuable, many must, of necessity, be failures, having been originated from natural and accidental impregnation, without any settled or philosophical plan. The laws of production in this department are the same as in other branches of the vegetable kingdom. For instance, in northern latitudes, the great object should be to produce good kinds which ripen early and are perfectly hardy. To procure these from the limited number of our native grapes, we must resort to the art of hybridization, taking for the parents those sorts which contain the characteristics we desire to combine. This work has already been commenced in good earnest, and is progressing rapidly in the hands of many practitioners. Illustrations have occurred under our own observation, proving the immediate and happy results from the crossing of native with foreign grapes. A gentleman in my own vicinity has taken, as the mother parent, the *Vitis Labrusca*, a common native grape, and crossed these vines with the pollen of the Black Hamburg, and the White Chasselas grapes. Of forty-five seedlings, thirty-seven have borne fruit. All progeny of these has proved perfectly hardy, and have stood without protection for several winters, where the Isabella and Diana have been much injured. Of the seedlings produced from impregnation of the Black Hamburg, most of them inherit, in a good degree, the color and characteristic of the male; while those fertilized with the White Chasselas, all were of a reddish color, intermediate between the natural colors of the parents. Thus we see the positive and powerful effect of the art of hybridization in the hands of scientific cultivators, who can, in a measure, control the process of reproduction, and render it subservient to their purpose.

But, to prevent discouragement and sustain perseverance, it should be remembered that, in conformity with the experience of Van Mons, Knight, and other pioneers, a seedling does not attain to perfection at once. To arrive at its culminating point of excellence, it must often be fruited for several years. Others maintain that a number of manipulations are as requisite to bring a new variety to perfection. Some varieties attain this much earlier than others, and the same variety reaches it earlier or later in different localities. Hence an originator should not reject a seedling of some apparent good qualities simply because it may have some defect; for this may result from local or external influences. He should, therefore, cause it to be transferred for trial to a different soil and climate. Even grapes of acknowledged excellence are improved by this change. The Concord and Diana of Massachusetts, valuable as they are at home, acquire a superiority in the south and south-

west unknown in their original locality, even rivalling the Catawbas and Isabellas of those sections.

It seems to be a general law of nature, illustrated in our forests and fields, that some trees and grains will flourish in nearly all localities and latitudes, while others are particularly restricted to certain districts. By this arrangement an all-wise Providence diffuses blessings over our country and clime. Each has its appropriate share in the general munificence of the Creator, together with luxuries peculiarly its own. The grape is common, and almost universal; but the varieties of this fruit are mutable and local, capable of endless adaptation by human skill. Hence this field for the culture of the grape, upon the borders of which we have scarcely entered, is, to the intelligent cultivator, full of promise and reward.

While it was formerly supposed that the peculiar, and, to many, the disagreeable aroma of our common grapes disqualified them for the production of choice fruits and wines, it has been proved, we think, beyond a reasonable doubt, that the characteristic designated, by way of contempt, as the fox or pole-cat flavor, will hereafter constitute one of the chief excellencies of our new varieties, when, by the art of hybridization and civilization, this flavor shall have been modified and changed, by alliance with other grapes of excellence that are destitute of this quality. This flavor, thus improved, seems destined to form a distinctive characteristic of an important class of American grapes, even to give them a marked superiority over such varieties as the Black Hamburg, Sweet-water, and such other foreign sorts as are destitute of any especial aroma, and consist mainly of sugar and water. It may yet make our seedlings rivals of the Muscats, the Frontignacs, and other highly flavored foreign grapes of the Old World. Multitudes of seedlings, deriving their origin from our native vines in various stages of civilization, and with a special view to this result, are now on probation in various parts of our country. From these must necessarily arise, in coming time, many sorts of superior quality.

What if the desire for new varieties has become a mania? What if it produce, here and there, personal sacrifices and disappointments? What if, from want of skill, or from adverse causes, many inferior or even worthless varieties are produced? The result is certain. The time fast approaches when the ultimate good will be realized, and when America will become the great grape-growing and wine-producing country of the world.

I admit, in respect to all our fruits, that, as the number of varieties increases, more judicious and severe discrimination in the selection of very valuable, and in the rejection of comparatively inferior varieties, will be demanded. This is the lesson which past progress teaches us. What would the gardener of fifty years ago have said, if he had been told that his favorite Bon Chretiens, Muscats and Blanquets, were soon to be thrown into the shade forever? He would have shown as much incredulity as some of our modern amateurs do when we talk of future progress. The Duchess d'Angoulême, the Beurré d'Anjou, Doyenné Boussock, Beurré Superfin, Bartlett and Seckel, had not revealed to him the vast extent of improvement in fruits which was to be made. What was true, in this respect, fifty years ago, is equally applicable to present varieties. The impossible has no place in the history of progressive science, whether relating to natural arts, or to mechanical industry.

CONCLUSION.

But, gentlemen, I have occupied my share of your time and attention, yet I must beg your indulgence in a few concluding remarks.

We have spoken here, and on former occasions, of the advancement which has been made in promology in our age and country. This is to be ascribed in part to the great scheme of Providence which has developed such stupendous results in the march of civilization and all the arts of life. Human pursuits are allied by affinities so intimate, that a remarkable discovery or improvement in one advances them all. Never before has the public mind been so profoundly moved, nor the energies of mankind so concentrated upon efforts to relieve toil, to perfect skill, to reward labor, and to multiply the comforts and blessings of life.

Truly we live in an age of transition and wonder! The invention of to-day supersedes that of yesterday, and in its turn is to be supplanted by that of to-morrow. No enterprise, however bold, adventurous, or vast, whether the construction of a railroad from the Atlantic to the Pacific; the lay-

ing of the mystic wire in old ocean's bed, or threading it through Behring's Straits and winding it around the globe, is too great for the capital, energy, or intelligence of the present generation.

How wonderful the scale of development in modern society! The old wheel and hand-loom of our mothers have passed away, and given place to the busy hum and clatter of our princely manufactories; the needle of the weary housewife, plied by day and night for clothing her family, has been exchanged for the ingenious sewing-machine, turning off its ready-made garments, and performing the labor of months in a day; the old printing-press of our Franklin, working off by the sweat of the brow only a few hundred newspapers per day, has yielded to the steam-press of our time, throwing off its twenty thousand impressions per hour; the brush of the artist patiently filling up his outline, touch by touch, through toilsome days, to the pencils of light in the hand of the king of day, picturing at a flash the image of yourself, and of all around you; the coaster, creeping cautiously along the shore, dependent on wind and tide, to thousands of steamboats which now dash over our lakes, rivers and oceans, despite of current or tempest; the old stage-coach, making only fifty miles per day, to our despatch and lightning trains, running fifty miles per hour; the horse express and carrier-pigeon, hailed as wonders in their time, to the electric telegraph, which, quick as thought, speaks with a tongue of fire, the languages of earth.

Discoveries, inventions, and improvements equally remarkable, characterize all the arts of husbandry. Witness, in place of the forked stick of the ancients, or the wooden plow of our boyhood, the improved iron plow of every model, and adapted to all kinds of soil and situation; and, still more marvellous, the Steam Plow, moving as a thing of life across the broad prairie, turning up its numerous furrows at once, and leaving behind it a wake like that of a majestic ship. Witness also, instead of the rude hook, the sickle, or the scythe of the farmer, slowly and tediously gathering his crops, our mighty mowing and reaping machine, cutting down its ten to twenty acres per day.

The great industrial pursuit which this Society seeks to promote furnishes testimony of progress not a whit behind the most favored of the arts.

Behold the improved methods of cultivation; the vast number of nurseries and orchards, springing up everywhere, as by enchantment; the novel processes of reproduction, multiplying plants in endless profusion, and as by the stroke of a magician's wand. Witness the interminable lists of varieties now in cultivation, increasing with each revolving year; the restless and anxious desire to obtain everything new and promising from whatever country or sea-girt isle it comes; the refined taste for choice fruits rapidly extending through every gradation of society; the standard of pomology, like the star of empire rising in the east, moving still onward to the west, and exciting the attention and astonishment of mankind.

But this progress results from no supernatural power. It is rather an illustration of human capability, acting in conformity with natural laws, and in harmony with the benevolent designs of the Great Husbandman for the amelioration of society, and the display of his infinite wisdom and love, "sought out of those who take pleasure therein." It exhibits the conquests of mind over matter, the dominion of man over nature, improving, adorning, and elevating her to the highest and noblest purposes of her creation.

Inspired with these sentiments, let us take encouragement, and press on in the career of improvement, ever remembering that study and experience make the man; and that, for the highest attainment and the greatest success, we must depend upon the culture of the mind as well as of the soil.

"Survey the globe through every zone,
From Lima to Japan,
In lineaments of light 'tis shown
That CULTURE makes the man.
All that man has, had, hopes, can have,
Past, promised, or possessed,
Are fruits which CULTURE gives or gave,
At industry's behest."

To cure burns or scalds, cover them at once liberally with wheat flour, sweet and nice, let them remain. They will heal rapidly, and all heat be drawn out.

The knowledge and fear of the Lord are the beginning of wisdom.

Chemical Composition of Soils—Application of Manures, &c.

Soils have been divided in the following way, according to the proportion of clay, sand, and lime, which they possess:

1. Argillaceous soils, possessing little or no calcareous matter, and above 50 per cent. of clay.

2. Loamy soils, containing from 20 to 50 per cent. of clay.

3. Sandy soils, not more than 10 per cent. of clay.

4. Marly soils, 5 to 20 per cent of calcareous matter.

5. Calcareous soils, more than 20 per cent. of carbonate of lime.

6. Humus soils, in which vegetable mould abounds. Below the superficial soil there exists what is called *subsoil*, which varies in its composition, and often differs much from that on the surface. Into it the rain carries down various soluble inorganic matters, which, when brought to the surface by agricultural operations, as trenching and subsoil ploughing, may materially promote the growth of crops.

HUMUS, or decaying woody fibre, exists in soils to a certain amount. This has been called also, *ulmine*, or *coal of humus*. In a soluble state it forms humic or ulmic acid. Humus absorbs ammonia, and it is slowly acted upon by the atmosphere, so as to form carbonic acid by combination with oxygen. Peaty soils contain much of this substance. When peroxide of iron is present in such soil, it loses part of its oxygen, and is converted into the protoxide.

SILICA in greater or less quantity, is found in all soils; but it abounds in sandy soils. In its ordinary state it is insoluble, and it is only when acted upon by alkaline matter in the soil that it forms compounds which can be absorbed by plants. Silica, in a soluble state, exists in minute quantities in soils; the proportion, according to Johnston, varying from 0.16 to 0.84 in 100 parts, while the insoluble siliceous matter varies 60.47 to 83.31 in 100 parts. Wiegman and Polstorf found that plants took silica from a soil composed entirely of quartz sand, from which everything organic and soluble had been removed. The following table shows the plants which germinated, the height to which they grew previously to being analysed, the quantity of silica they contained when planted and the increase:

		Silica in the Ash.		
	Height.	Seed.	Plant.	Silica had increased
Barley....	15 inches	0.034	0.355	10 times
Oats.	18 "	0.064	0.354	5½ "
Buckwheat	18 "	0.004	0.075	18 "
Vetch.....	10 "	0.013	0.135	10 "
Clover... .	3½ "	0.009	0.091	10 "
Tobacco..	5 "	0.001	0.549	500 "

ALUMINA exists abundantly in clayey soils, but it does not enter largely into the composition of plants. It has the power of absorbing ammonia, and may prove beneficial in this way.

LIME is an essential ingredient in all fertile soils. In 1000 lbs. of such soil, there are, according to Johnston, 56 lbs. of lime; while barren soil contains only 4 lbs. The presence of phosphoric acid in soils, in the form of phosphates of potass, soda, and lime, is essential for the production of certain azotised compounds in plants; and sulphuric acid, similarly combined, is required for the formation of others.

A rough way of estimating the general nature of a soil, is thus given by Prof. Johnston:

1. Weigh a given portion of soil, heat it and dry it. The loss is water.

2. Burn what remains. The loss is chiefly vegetable matter.

3. Add muriatic acid to residue, and thus the quantity of lime may be determined.

4. Wash a fresh portion of soil to determine the quantity of insoluble siliceous sand.

Such an analysis, however, is by no means sufficient for the purposes of the farmer.

The chemical composition of a plant being known, conclusions can be drawn as to the soil most suitable for its growth. This is a matter of great importance both to the farmer and to the planter. In order that the plant may thrive, even in a suitable soil, exposure and altitude must also be taken into account. It is only by attention to these particulars that agricultural and foresting operations can be successful. As regards trees, the following practical observations are given as an illustration of what has been stated. The Scotch Fir thrives best in a healthy soil, incumbent on a pervious subsoil, and at a high altitude; Larch in loam, with a dry subsoil, and a high situation; Spruce and Silver Firs, will grow in a dry or peaty soil; Oak in any soil and situation under 800 feet above the level of the sea, but

it thrives best in clayey loam, on a rather retentive subsoil, and on gently sloping ground; Ash and Elm, on a gravelly loam, on gravel or sand, at an altitude under 500 feet above the level of the sea; Sycamore, at 100 feet higher than the Ash or Elm, and in a more retentive soil and subsoil; Beach, on a dry gravelly soil, and in a rather high situation, but it is often luxuriant on strong retentive clay, and in a low damp situation.

APPLICATION OF MANURE.

If the soil does not contain the ingredients required for a crop, they must be added in the form of manure. The principle of manuring is to supply what the plant cannot obtain from the soil, and to render certain matters already in the soil available for nutrition. In order that this may be properly practised, there must be an analysis of the soil, of the plant, and of the manure. Hence the importance of agricultural chemistry to the farmer.

VARIOUS KINDS OF MANURE.

NATURAL MANURES, as farm-yard dung, are more valuable than *simple manures;* inasmuch as the former furnish all the substances required for the growth of plants while the latter only supply a particular ingredient. The plant itself, in a soluble state, would be the best manure. In ordinary farm-yard manure, the straw is again made available for the purpose of the plant. The whole crop of wheat and oats, however, cannot be returned to the soil, as part must be retained for food. A substitute, therefore, must be found for the portion thus taken away. This contains both azotised and unazotised matters, the former consisting of proteine compounds which supply nitrogen for the muscular tissue of man and animals; the latter of starchy, mucilaginous and saccharine matters, which furnish carbon as a material for respiration and fat. The object of manuring is chiefly to increase the former, and hence those manures are most valuable which contain soluble nitrogenous compounds.

The value of manures is often estimated by the quantity of gluten which is produced by their application. Hermbstaedt sowed equal quantities of the same wheat on equal parts of the same ground, and manured them with equal weights of different manures, and from 100 parts of each sample of grain produced, he obtained gluten and starch in the following proportions:

	Gluten.	Starch
Without manure	9.2	66.7
Cow dung	12.0	62.3
Pigeons' do.	12.2	63.2
Horse do.	13.7	61.6
Goats' do.	32.9	42.4
Sheep do.	32.9	42.8
Dried night soil	33.1	41.4
Dried Ox blood	34.2	41.3

Manures containing ammonia, owe their excellent qualities to the nitrogen which enters into their composition; hence the value of sulphate of ammonia, ammonial liquor of gas-works and urine. The value of guano, or the dung of sea-fowl, depends chiefly on the ammoniacal salts, and the phosphates which it contains; thus supplying the nitrogen and phosphorous requisite for the proteine compounds which contain the elements of flesh and blood. The guano, which is imported, is the excrement of numerous sea-fowl which frequent the shores of South America and Africa. It often contains beautiful specimens of infusoria, as Campylodiscus, Coscinodiscus, &c. The guano found in caves on the coasts of Malacca and Cochin-China, is the produce of frugivorous and insectivorous bats, and of a species of swallow—the last being the best.

The following analyses by Dr. Colquhoun of Glasgow, which are the result of an examination of a large number of samples give a general idea of the composition of guano. The term *ammoniacal matter*, includes urate of ammonia and other ammoniacal salts, as oxalate, phosphate, and muriate, as well as decayed organic matter of animal origin. The term *bone earth*, includes phosphate of lime, (always the principal ingredient,) phosphate of magnesia, (always in small amount,) oxalate of lime; and in African guano, a minute quantity of carbonate of lime, and from ½ to 2 per cent. of fragments of sea shells. The *fixed alkaline salts*, are various salts of soda, as muriate, phosphate, and sulphate; a little of a potash salt has been detected.

SOUTH AMERICAN GUANO.

	Fine Chincha.	Middling.	Inferior.	Low qualities	
Ammoniacal matter,	62	42	28	12	15
Bone earth	20	24	30	50	37
Fixed alkaline salts,	10	14	21	10	5
Rock, sand, earth	0.5	5	3	15	34
Water	7.5	15	18	13	9
	100.0	100	100	100	100

AFRICAN GUANO.

	Best Ichaboe.	Inferior.	Low quality.
Ammoniacal matter.	45	28	20
Bone earth	20	21	17
Fixed alkaline salts	12	16	14
Rock, sand, earth	1	3	25
Water	22	32	24
	100	100	100

The guano from the islands on the British coasts, contains the same ingredients, but the soluble salts are generally washed out by the action of rain. The following is the analysis, by Dr. R. D. Thomson, of guano gathered on Ailsa Craig:—

Water	50.30
Organic matter and ammoniacal salts, containing 3.47 per cent. ammonia	12.50
Phosphates of lime and magnesia	12.10
Oxalate of lime	1.50
Sulphate and phosphate of potash, and chloride of potassium	1.00
Earthy matter and sand	15.00

SIMPLE MANURES supply only one or two of the materials required for the growth and nourishment of plants. The *ammoniacal liquor of gas-works*, in a very diluted state, has been advantageously applied to the soil, on account of the nitrogen which it supplies. *Soot* has also been used, from furnishing salts of ammonia. *Nitrates of potash and soda* have been recommended not only on account of the alkalies, but also on account of the nitrogen which they contain in the form of nitric acids. The quantity of gluten is said to be increased by the use of nitrates. *Carbonate of potash and soda and chloride of sodium*, are frequently used as manures. The latter is especially useful in the case of plants cultivated inland, as Cabbages, Asparagus, and Sea-kale. As *lime* is found in all plants, the salts containing it are of great importance. It may be used in the caustic state, with the view of decomposing vegetable matter, and aiding in the formation of carbonic acid. It also neutralizes any acid previously in the soil, and is said to occur occasionally in boggy and marshy land, abounding in species of Juncus, Carex, and Eriophorum, with some Calluna vulgaris. Lime also combines with certain elements of the soil, and sets potash free, which reacts on the silica, and renders it soluble. Lime is sometimes washed down into the subsoil; and, in such cases, trenching improves the land. *Phosphate of lime* is a valuable manure, both on account of the lime, and of the phosphorus which it contains. Whithout the presence of phosphates, gluten, and the proteine compounds of plants, cannot be formed. Phosphate of lime exists abundantly in animal tissues; and hence it must be furnished by plants The use of bone-dust as a manure, depends in a great measure on the phosphate of lime which it contains. Besides phosphate of lime, bones contain about 3 per cent. of phosphate of magnesia, carbonate of lime, and salts of soda. The gelatine of bones also seems to act beneficially, by forming carbonic acid and ammonia. Bones are best applied mixed with sulphuric acid,* so as to give rise to the formation of soluable phosphates by decomposition. They are broken into pieces, and mixed with half their weight of boiling water, and then with half their weight of sulphuric acid. The mixture is applied to the soil, either in a dry state by the drill, with saw-dust and charcoal added, or in a liquid state, diluted with 100 to 200 waters. Phosphates and other inorganic matters, sometimes exist *potentially* in the soil, but in a dormant state, requiring the addition of something to render them soluble. Allowing the ground to lie fallow, and stirring and pulverizing it, are methods by which air and moisture are admitted, and time is allowed for the decomposition of the materials, which are thus rendered available for plants. *Sulphur* exists in considerable quantity in some plants, as Cruciferæ, and it forms an element in albumen; hence the use of sulphuric acid and of sulphates in manures. Sulphate of lime or gypsum, is well fitted as a manure for clover. It acts in supplying sulphur and lime, and in absorbing ammonia. *Charcoal* in a solid state, has been applied with advantage as a manure. It acts partly by taking up ammonia in large quantities, and partly in combining slowly with oxygen, so as to form carbonic acid. The effects of carbonic acid on vegetation are said to be remarkably conspicuous in some volcanic countries, in which this gas is evolved from the bottom of lakes. When it accumulates in large quantities, however, it destroys plants as well as animals.

MANURING WITH GREEN CROPS is sometimes practised. The mode adopted is to sow certain green crops, the roots of which

* Putrefaction is preferable. See Tyson's report, page 366, June number Southern Planter.—[EDITOR.

extend deeply into the soil; and when the plants have advanced considerably in growth, to plough them in, and sow a crop of some kind of grain. In this way the nutritive matter from the deeper part of the soil is brought within reach of the roots of the grain crop. Manuring with *sea-weeds* is also resorted to in cases where they are accessible. They supply abundance of carbonate, phosphate, and sulphate of lime, besides chloride of sodium. There are considerable differences in their chemical composition; thus, while in Laminaria saccharina, alkaline carbonates, potash, and iodine, predominate; in Fucus vesiculosus and serratus, sulphates and soda are in excess, and iodine is less abundant. In the cultivation of the Coco-nut Palm, Mr. M'Nab finds that sea-weeds act very beneficially.

LIQUID MANURES have of late years been much employed, and the formation of tanks for their reception has been strongly recommended, in which the ammonia is fixed by the addition of sulphuric acid or charcoal. They can be applied after vegetation has advanced, and they are in a state to be made at once available to the crop. More recently some have advocated a system of *steeping* seeds and grains in certain solutions before sowing them. Professor Johnston suggests a mixture of phosphate of soda, sulphate of magnesia, nitrate of potash, common salt, and sulphate of ammonia (1 lb. of each), in ten gallons of water, to steep 300 lbs. of seeds, which are to be afterwards dried with gypsum or quicklime.

The following experiment, conducted by Mr. Wilson, at Knock, near Larges, shows the mode of estimating the effects of manures. The land was a piece of three-year old pasture, of uniform quality. It was divided into ten lots, and these were treated with different kinds of manure. The quantity of well-made hay is given in pounds:—

			Produce per Lot.	Rate per Acre
Lot	1.—Left untouched,		420	3360
"	2.— 2½ barrels	Irish quicklime,	602	4816
"	3.— 20 cwt.	Lime of gas-works,	651	5208
"	4.— 4½ cwt.	Wood charcoal powder,	665	5320
"	5.— 2 bushels	Bone-dust,	693	5544
"	6.— 18 lbs.	Nitrate of potash,	742	5936
"	7.— 20 lbs.	Nitrate of soda,	784	6272
"	8.— 2½ bolls	Soot,	819	6552
"	9.— 28 lbs.	Sulphate of ammonia,	874	6776
"	10.—100 gallons	Ammoniacal liquor of gas-works. 5° Tweddell's hydrometer,	945	7560

The value of each application was the same, all were applied at the same time, and the grass also was cut at the same time.

Plants are thus employed to form from the atmosphere and soil those organic products which are requisite for the nourishment of man and animals. While an animal consumes carbon so as to form carbonic acid, gives off ammonia in various excretions, transforms organized into mineral matters and restores its elements to air and earth; a plant, on the other hand, fixes carbon in its substance and gives off oxygen, forms from ammonia solid compounds, transforms mineral into organized matters, and derives its elements from the air and earth. Thus, says Dumas, what the atmosphere and soil yield to plants, plants yield to animals, and animals return to the air and earth, a constant round in which matter merely changes its place and form.*—*Balfour's Botany.*

* For fuller particulars as to the food of plants analyses of plants, soils, manures, and rotation of crops, see Johnston's Lectures on Agricultural Chemisty; Liebig's Works; Dumas on Organic Nature; Davy's Agricultural Chemistry, by Shier; Mülder's Chemistry of Organic Bodies, translated by Fromberg; and various Papers in the Quarterly Journal of Agriculture, 1844–46; Saussure's Works; Daubeny on Rotation of Crops, Phil. Trans. 1845; Boussingault, Economie Rurale.

Silver and Silver-Plated Articles.—The readiest mode of cleaning these articles, is to wipe them over with a weak solution of liquid ammonia. This readily removes the sulphide, and no rubbing, or scarcely any is required. The same agent will be found useful in cleaning gold chains and jewelry.

From the Transactions of the Highland and Agricultural Society.

On Breeding and Rearing Cattle.

By Henry Tanner, *Professor of Agriculture, Queen's College, Birmingham.*

[premium gold medal.]

NO. II.

(*Continued from October Number.*)

The Management of the Yearling Heifers may now be noticed. These will be brought from the fields in which they have been summered, and placed in sheltered situations near the homestead. An open yard, with sufficient shedding, is by far the best place for wintering young growing stock, and especially in preparing them for avoiding the quarter-evil, to which heifers of this age are peculiarly liable. Exercise is of the greatest importance to young and growing stock, as it enables them to bring the various parts of the body into action, and thus induces a healthy development of the organism. In addition to which, if young cattle have good shelter, and can at all times rest in a dry and comfortable position, they become more hardy in their constitution, and better able to withstand the attacks of disease, than that enervated and enfeebled class of stock which are confined in warm and ill-ventilated buildings during the winter months. I have experienced the difference in a marked degree, and I am fully persuaded that the want of exercise, and the too careful housing which young stock sometimes receive, are frequently productive of much injury to the constitution. On the other hand, when stock are neglected, and have little or no shelter from the storms of winter, they must necessarily suffer therefrom. The medium course is the best. Give the young cattle warm and comfortable shedding, with plenty of exercise, fresh air, and a liberal supply of bedding, and no fear need be entertained but that they will thrive, and remain more healthy throughout the winter and *following summer*, than when kept in any other manner, especially under a system which shields them from every change of temperature, like conservatory plants. It is needless for me to draw the attention of my readers to the difference in their coats in the spring. If they are thus treated they retain their rough coats, as nature intended they should, until the weather renders it desirable for them to be cast away; but when young stock come from the houses in the spring, they generally have the sleek coat of summer to withstand weather for which it is not sufficient, and the result is a check, which is in most cases accompanied with an inflammatory tendency.

It may be argued that an economy of food requires a different system of management. I readily yield the point that stock which are thus exposed require more food than others will consume in more sheltered situations, and hence there is a sacrifice made in this respect. But I believe it to be a sacrifice which is well worth making, because you obtain thereby a degree of hardiness for the animal which is extremely valuable, and in comparison with which the extra food consumed is not worthy of consideration.

The usual food for yearlings during the first winter is hay and turnips. This is a very suitable food, but the addition of 1 or 2 lb. of oil-cake daily, according to the size of the breed, will favour their growth and condition, and much more than repay the expense (say 1d. to 2d. per day) in the animal, whilst the manure in the yards will be of superior quality. Hitherto the use of oil-cake has been too much confined to the *fattening* stock of the farm, but I believe its use upon *the store stock* is frequently attended with *more profit* than upon the fat stock. It is, however, worthy of passing remark, that store stock thus accustomed to small quantities of oil-cake subsequently fatten more easily than others not thus prepared for fattening. It will generally be found desirable to fasten up store stock whilst having their cake; a more regular consumption will then take place, and the stronger animals will be restrained from taking the share of a weaker neighbor.

Another point in the management of growing stock, and which is of great importance, is quiet and gentle treatment—everything like harshness being studiously avoided. They should rather be accustomed to receive attention, and allow persons to approach them without fear. In some yards it is almost impossible to approach them without the danger of their injuring themselves in their attempts to escape; whilst in other cases, when accustomed to quiet treatment, strangers even may approach and examine them.

By continuing such a careful and liberal course of treatment throughout the winter, we shall find the yearlings in good condition, and ready for being turned out to grass as soon as the season and the herbage are sufficiently advanced. During the second summer shelter and good keep will be equally beneficial, although not equally imperative, still nothing like a check should ever be allowed. The use of oil-cake may be advantageously continued to a small extent—say 1 lb. daily; but when the pasture is deficient, it may be increased. This will improve the land, whilst the stock will grow better and be much more healthy. In fact, it has been found that the use of small quantities of oil-cake has prevented the quarter-evil—a disease much dreaded by most stock-breeders.*

* Mr. Wilson, Edington Mains, considers the use of linseed-cake as a specific in quarter-evil. His invaluable Prize Report on the Rearing of

This *quarter-evil* is a subtle complaint, which is almost peculiar to our yearlings. It carries off large numbers of stock, and when its attack is commenced there is little hope of recovery. One general cause may be observed in the majority of cases, and it is the result of bad management. From some cause or other the yearlings have had *a check* in their growth. It may be from being wintered badly, or possibly from being put upon inferior pasture in the early summer, or it may be from sudden change from warm buildings during the cold nights of May, followed by a sudden removal to better keep or more shelter. The first result of this change is a gradual improvement in the animal, which continues in a marked degree until the system is preparing more blood from this rich food than it has energy to use, and the result is an inflammatory action in one quarter of the body. Had the system been kept in a state of progressive improvement, it would have been prepared for the healthy employment of the nourishment brought into the system, but as this nourishment follows a period of scarcity, the system receives this rapid increase of rich blood more quickly than it regains its energy to use it, and hence an inflammatory action commences.

There are various modes adopted to prevent this attack. A seton in the dewlap is frequently employed with success. Occasional doses of purgative medicine have been found useful. The cause, however, appears to suggest the preventive by avoiding periods of insufficient food being followed by strong keep. It will sometimes happen that the keep is not sufficiently abundant for the stock, but this should be met by the use of artificial, (such as oil-cake, for instance), and great caution should be shown in putting stock upon better keep after they have had a short supply.

If, however, the quarter-evil makes its appearance, I have been frequently successful in curing the animal by giving one of the following powders three times daily—digitalis, 1 scruple; nitre, 1 drachm; tartar. antimony, 1 scruple. Its utility depends upon its *immediate* use, for the loss of half an hour may determine against its being of any service. The appearance of this disease should lead to extra diligence in preventing any others from suffering in the same manner, as generally there are others similarly predisposed for its attack.

Rheumatism is often productive of much inconvenience, and especially amongst cattle of this age. It generally arises from a want of sufficient shelter, or from stock being kept in low, damp land late in the season. Remedies are here of little service, for the attack soon passes off after they are removed from the cause.*

Management of Two-year-old Heifers.—Little need be added to the foregoing to describe the course of management which should be adopted the following season, for it is simply a repetion of the former year's practice. I shall therefore proceed at once to consider the time at which heifers should be allowed to breed. The practice of breeders differs widely as it is possible, and many adopt a course they do not entirely approve of, to overcome greater difficulties which present themselves in making many of our best animals breed. These difficulties are oftentimes almost insurmountable, and many of our best animals are consequently placed in the hands of the butcher, with a very reluctant will on the part of the breeder. It is very desirable we should understand the causes which come into operation, as they are productive of much inconvenience and delay, and frequently lead to the loss of our best animals.

The fact is, what we consider a *perfect* animal is altogether an unnatural development. The consequence is, that as we diverge from the original type, so increased difficulties are thrown in our way for reproducing animals possessing such unnatural characters. If we take an ordinary cow or heifer, reared on common land or moors—it may be, under many hardships and privations—we find no difficulty in breeding from such an animal; but when we have—as we call them—better bred animals to deal with, we find a progressive series of difficulties. Are we then to consider the design of Nature incomplete in this respect? Certainly not. This is no solitary instance of the opportunities of improving natural produce which stimulate the energy and industry of man, and of the reward which follows his perseverance. Look at the general produce of a farm, and observe the extent to which many of our most valuable productions differ from and

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Cattle, published in the Transactions, may be consulted on this point. I have never met with a case of this disease in all my experience. Good keeping, however, may be considered not as a preventive in every instance.—a famous breeder of improved short-horns having lost in one summer four calves, which had been treated in the most liberal manner. The same breeder had lost from time to time so many fine animals by the disease, that he had to give up, from prudential motives, the breeding of valuable stock. This instance is rather against the idea that oil-cake is an unfailing remedy against the malady. Other agents, such as atmospheric influences or nature of the soil, have in all probability not a little to do with it.

J. D., Athelstaneford.

* The effect of rheumatism is understated; it frequently assumes an aggravated form, when once the ligatures and membranes of the joints get inflamed. A chronic tenderness or inflammation sets in; for such cases there is no cure. Young bulls are most subject to it. It is supposed by many to be the effects of cold, chills, or want of sufficient exercise while the animals are allowed nutritious food.—*J. D.*

surpass the originial specimens from which they may have been obtained. All, however, if neglected, possess a tendency, as it is termed, *to degenerate*, or, in other words, to resume their original character; and this is doubtless a valuable property. Our improved cattle do not possess those conditions which are best adapted for perpetuating the species; and it becomes evident, upon examination, that nature, whilst she has with jealous care made abundant provision for perpetuating every description of animal and plant, and given them habits and developments best adapted to this end, has at the same time given them expansive capabilities. Thus, under the care of man, they are capable of improvement; but as soon as he neglects them, they gradually reassume their original form, in which they are independent of his care. So far, then, from being an imperfection in the design of Nature, we see here how she encourages those who strive for improvement, whilst at the same time she has not overlooked the safety of the species when neglected and uncared for by man.

The difficulties which impede our breeding from highly developed animals are two-fold—barrenness, an incapacity to retain the embryo. These are too often looked upon as similar, but there is a great difference between these two causes. Barrenness results from an imperfect development or action of the organs of generation; but in order that this may be fully understood, it will be important to have a clear view of the process of productive generation. The seed is formed in the ovaries of the female; as soon as an ovum is fully ripened, it causes a very great degree of excitement, and the animal manifests its desire for the male. This period is determined by the ovum becoming fully matured. Around the mouth of the ovarium we find the fimbriæ, which hold in their convoluted folds the ovum thrown off by the female, until the same is impregnated by the seminal fluid of the male. The impregnated ovum then descends through one of the Fallopian tubes into the uterus, and the development of the embryo into a fœtus immediately commences.

It is evident that many circumstances may render the animal incapable of breeding; for instance, malformation of any of the parts, and also want of energy in the system to enable the ova to be formed. Natural barrenness of this kind is beyond our control, and the animal will have to be fed; but generally speaking, the animal comes into heat periodically, and hence some other cause is indicated, for it seldom if ever happens that an animal which is incapable of breeding from the two former causes manifests this desire for the male. When, however, this is never observed, it is an old-fashioned plan to give her a quart of milk from a cow which is bulling, and it is said to produce an excitement of the energy which had previously remained dormant.

The majority of cases of difficult breeding may be traced to the excitement of the uterus throwing off the impregnated ovum instead of allowing it to remain and become fully developed into a fœtus. The consequence is, that many animals continue to take the bull month after month without being productive, and various methods have been adopted to overcome this difficulty. Some bleed the animal immediately upon her taking the bull, so as to draw away blood from the part, and decrease the excitement; others throw water over the hinder part of the animal, with a view of driving the blood to the anterior portion of the body; another method is to throw some water into one of the years of the animal; this gives a shock to the system, and the fright draws off the attention, and consequently lessens the excitement in the uterus. I have found the most successful plan is to allow the bull to serve again when the period of heat is passing off. It is, however, generally necessary to use a young bull for this purpose.

Many breeders of high-bred stock, to overcome this evil, have their heifers put to the bull very much earlier than they otherwise would do—in some cases when little more than yearlings. It is very evident that a great sacrifice is made by adopting this plan. Before an animal has made its growth and its parts have become fully developed, the energy of the system is diverted towards another object; if, therefore, the nourishment the heifer receives is divided between promoting its own growth and that of the calf, it is evident that both will suffer therefrom. The parent is thus thrown out of proper form by the weight it has to support, and the entire system suffers from an excessive demand on its strength. The offspring is equally prejudiced, for it receives the constitution of an enfeebled parent, and for a considerable time shows the ill-effects upon its system.*

It has been considered that this difficulty of breeding is a necessary consequence, but I have to a great extent overcome it by adopting the following plan. Presume that we are dealing with a choice lot of heifers, which have had every means and opportunity for becoming fully developed, and that from the period of birth until they are, say, from twenty-one months to two years old, they have been reared with the view of producing as perfect animals as the breed will allow. Supposing them to

* Heifers may, at sixteen months, if properly developed, be put to breed without any injurious consequences, provided always that they are liberally fed during the period of gestation, and not allowed to suckle their offspring. By being put on good pasture they will grow freely, and this practice almost insures them going on breeding, and their shape is not injured.—*J. D.*

have been calved early in the year, they would, when brought into the yards, be twenty-one months or thereabouts: instead of putting them upon good food, they should be put upon a straw diet for a month or six weeks, not simply that they may pick over the choicest portions, but eat the greater part supplied to them. The result is, that this diet leads to a loss of condition, and a greater aptitude for breeding immediately results; for it is a law of nature, that any check upon the animal which threatens to endanger its permanency (disease excepted) diverts the energy of the body to a reproduction of its species.

I have seen the end gained by sending stock to another district, giving them change of climate and herbage, but it must be to inferior rather than superior keep. Heifers which have been removed from rich land in consequence of the unsuccessful endeavour to make them produce stock, and put upon the moors, have been found to breed directly. Of course, judgment must be used in the degree to which such a check should be carried, for a remedy which in itself is valuable may be rendered destructive by injudicious use.

My own experience and observation lead me to the conclusion that, through the early stages of life, a liberal system of feeding is most desirable, and that it should be continued until the animal has become well developed and ready for breeding. Then give a sudden change from good keep to a straw diet, and after four or six weeks commence using the bull. I would strongly urge that the bull should not be used until the heifers are thus prepared; for when once an animal has returned to the bull, it has a *greater* tendency to do afterwards. I therefore strongly recommend breeders not to use the bull first, and having found it fail, then to adopt the above system. They should be carefully separated from other stock for some hours after they take the bull each time, and subsequently kept apart until all signs of heat have passed away. Should any cases arise in which the heifers fail to prove in calf by this method, and the breed is of such value as to render the additional expense but of little importance, send them away to the nearest common or moor for the following season, and let them be regularly brought to a good bull. I need scarcely say that any which prove to be in calf should *gradually* receive better food.

The difficulties which breeders have to contend are not confined to the female side; it is therefore important to glance at the other part of the question. In rearing a bull the principles I have named apply with equal force, but I am bound to say are not equally disregarded. In fact, the generally-received impression is, that the young bull should have every opportunity for arriving at a perfect growth. I shall not therefore occupy valuable space by a recapitulation, but rather state that the same liberal system of feeding is of even greater importance in the case of the blul than I have represented to be for the heifers. Many allow young bulls to commence serving cows when twelve months old, but it is not to be recommended. I should rather advise delay until twenty or twenty-four months old. Up to this time every inducement should be given to the system to attain a perfect development by a careful course of management. Afterwards, however, whilst used as a breeding animal, it it desirable to keep the bull *in good condition*, but not as *fat* as is usually done. It is true that "fat hides faults," but the breeder need not thus blind himself, and add to any existing deficiency in the animal a want of vigour and energy which it is so important the bull should possess.

We may safely take it as a rule that, after a bull has attained a full development, our object should be to keep him in *active working condition*, rather than as a *fat* bullock. It is altogether a false idea that a tendency to this *excessive* fatness is given to the stock. My own conviction is, that the same bull, in good working condition, would throw a more healthy calf than he would when excessively fat, and with at least an equal disposition for fatting. In addition to this we must overlook the large number of failures and disappointments which arise from *fat* bulls. There is less activity and less power without any compensating advantage; and therefore I suggest that the bull should be allowed to become well developed before being used, and subsequently, whilst being fed liberally, the food ought rather to have a tendency to form muscle than fat.

We may now refer to some other causes which render bulls unproductive of stock. There may be a natural incapacity to produce stock from malformation; but this, although existing in some instances, is not frequent. Sometimes, however, an animal having produced calves, loses the power of reproduction either for a time or permanently; this is generally the result of disease. It may arise from over-exertion, or premature use, but more frequently from inflammatory action, induced by contact with cows which have been driven far, or which have been running about violently. Many choice bulls are thus injured from cows being sent considerable distances. Cows which have been driven from a distance should always remain in some loose-box as long as may be prudent, so as to cool down before being put to the bull. If, however, the bull has caught this disease, he should be kept from breeding for a time, and the parts regularly fomented, and cooling medicine given. Mischief generally happens from the early symptoms being neglected, and thus the bull often becomes worthless.

Close relationship of blood is another cause of unproductive bulls; and they are often condemned, as incapable for producing calves, when an entire change of blood disproves their

incapacity. This is even more evident with heifers.

In conjunction with this part of my subject, it may be desirable to make a few passing comments upon the chief points of character which should be possessed by breeding animals. I do so irrespective of breed; for although each distinct breed may have its own peculiarities, yet there are certain qualities which should be possessed by all breeds in common with each other. The first point to be clearly settled is the class of animal to be produced. It is not enough to decide upon breeding from a cow or heifer; we must rather decide what we want to produce, and select our animals accordingly. It may be either breeding, dairy, or beef-producing stock, which is required, but each renders a modified course desirable, and I may say necessary.

Breeding Stock.—As a general rule, it may be taken that, to produce superior stock, no middle course is safe or successful. The *best* stock obtainable should be bred from, and it is bad policy to spare any moderate outlay in securing first-class animals. Many obtain *second*-class animals, and endeavour to raise from them superior breeding stock. I am convinced it is a wrong policy to adopt. Breeders will not generally spare their best animals, and it frequently happens that the best cannot be obtained. In such cases there is no choice but to select the best that may be obtainable.

In such cases *pedigree* is fully entitled to our consideration, and it is desirable that it should be watched with care. In all cases where the breed has been carefully preserved pure, great benefit will result from doing so. The character of a breed becomes more and more concentrated and confirmed in a pedigree animal, and this character is rendered more fully hereditary in proportion to the number of generations through which it has been transmitted. By the aid of pedigree, purity of blood may be insured, and a systematic plan adopted by which we can perpetuate distinct families, and thereby obtain a change of blood without its being a cross. It is evident that any one adopting a systematic arrangement will be able to do this more effectually than another without this aid. This is the more important when the number of families is small, as is the case with Devons and Herefords, especially the former. The individual animals from which the Devons are descended are very limited in number and in a few hands, but, with some honourable exceptions, little attention is given to this point. The importance is rendered evident by the decreasing size of the breed, the number of barren heifers, and the increased delicacy of constitution shown in the stock of many breeders of that district who are not particular in this respect. The contrast between such herds, and those in which more care and judgment are exercised, renders the advantages of attention to pedigree very evident; for here the strength of constitution is retained, together with many of the advantages of this valuable breed.

Having then, with due consideration, selected the breed and the families of that breed possessing the points which are to be perpetuated, it is necessary to take individuals therefrom. The cows should be characterised by an aptitude for producing fine calves and bringing them to a full degree of development. They should therefore be good milkers, for the value of the produce will be very much regulated by this character. We shall have occasion to see subsequently that this property is in no degree prejudicial to any other desirable point of character. This tendency to produce milk not only influences the supply of food to the young animal after its birth, when any deficiency may be remedied, but it regulates the growth of the calf before birth when a substitute cannot be used. Thus many of our best-bred short-horn cows produce calves which are very imperfectly developed and exceedingly weak—so much so, that many persons accustomed to *inferior* stock would consider them scarcely worth rearing. This is mainly referable to the supply of nourishment given to the calf being so small, for the subsequent supply of milk clearly indicates how limited had been the support given to the fœtus.

This neglect of the milking disposition is a great evil at the present day, and our best breeds are suffering, and will continue to suffer, from it until more attention is given to this point in the awards at the National Exhibitions. Here it should be made a leading point of merit, and this would stimulate breeders to give more attention to it. It has been sadly overlooked, but it is in the power of the Highland Agricultural Society, and other kindred societies, to do much to bring our breeding cows into a more satisfactory state in this respect. Already, great complaints have been made of stock sent abroad, and particularly from America, which acts prejudicially on ourselves; and when it is seen that the possession of milking properties may be advantageously encouraged even in our best breeds, it is evident that it is only necessary to draw attention repeatedly to this fact, and sooner or later it must be corrected.

Breeding cows should also possess *strong and healthy constitutions*, and there are certain developments of figure which indicate their existence. No one would consider a flat-ribbed animal with a narrow carcass and contracted chest to give promise of health; neither would the rising of the rump-bone be a good feature. These are sure signs of predisposition to consumption and diarrhœa. The full round barrel and the deep wide chest, together with a level back and broad pins, are essential points of healthy constitutions.

We are well aware that many diseases are transmitted from the parent to the offspring,

which must be jealously guarded against. Dysentery, consumption, scrofula, and rheumatic affections have been clearly proved to be perpetuated in this manner. It is therefore of the deepest importance to avoid anything of the kind in the parents selected for a herd of breeding cattle. The three former frequently result from relationship being too close, in other cases arising from different causes, but the effect is the same, so far as regards the extension of the evil. That boldness of figure which we prize as indicating a well-developed animal is also valuable as a sign of health and vigour. Thus, those points which are so pleasing to the grazier are equally valuable to the breeder.

The breeder of first-class stock cannot be too particular in his selection of bulls. He must always be prepared to detect the weak points of his stock, and remedy them by using a bull well developed in these respects. Notwithstanding the great importance of having good cows to breed from, the influence exerted by the bull renders his quality and character of even greater importance. Not only are his good or bad qualities spread through the large number of cows he serves, but there are certain hereditary qualities more fully transmitted from the bull than the cow. The bull, therefore, should be as perfect as can be obtained, and possess the greatest purity of descent.

The following points may be said to indicate a well-developed bull:

The Head should be rather small in proportion to the animal, and well set on the neck, with a fine tapering muzzle, a broad forehead, bright full yet placid eyes, furnished with a graceful horn of fine quality, and ears small and fine.

The Neck should be thick but not too short, but having a graceful appearance by tapering steadily towards the head, and yet not getting thin behind the ears.

The Shoulder should be snugly in the carcass; it should be covered with a well-developed muscle down to the knee, below which it should possess a fine and flat bony structure.

The Chest should be bold and prominent, wide and deep, furnished with a deep but not a coarse dewlap.

The Carcass should be barrel-shaped, having a top level and broad, especially across the hips, the ribs should be well rounded, the space between the last rib and the pin should not be too short, yet at the same time we must guard against too much length; there will, however, be little cause for objection if the rib is well rounded and the bone flat, for it will add weight to the animal in a good part. The flank should be full and pendant.

The Hind Legs should be full and fleshy down to the hock, with a well-developed buttock, showing great substance, but below the hock we require a fine and cleanly-formed bone.

The Tail should be finely formed, without much hair.

The Hide mellow to the touch, covered with a fine yet plentiful coat of hair.

Animals thus developed in all these points will be alike gratifying to the eye of the connoisseur and profitable to the grazier.

Bulls have a natural tendency to show points of failure which are not observable in bullocks; and, taking all breeds into consideration, this is most frequently noticed by a deficiency in the hind quarters of the animal. Whilst, however, we should endeavour to obtain a bull as perfectly formed as possible, it is especially desirable to secure a full, I might almost say an excessive, development of any part which may be deficient in the cows or heifers he has to be used with. If they are weak, either in the fore or hind quarter, or if deficient in size, this may be remedied by selecting a bull distinguished for possessing these properties in an unusual degree.

It is in this respect that the extensive breeders have such advantage over those keeping smaller herds. It is necessary for them to keep three or four bulls, and very often they have more. The consequence is, that a selection can be made in such cases according to the deficiency of the heifer or cow; whereas, where only one bull is kept, this cannot be without involving the expense and trouble of sending to a distance, and often this is not available. It is a matter of doubt with some how far an increase of size obtained by using a large bull can be done with safety to the females producing the calves. No fear need be entertained on this ground. The female *alone* determines the size of the calf at birth, but subsequently a larger growth shows the increase of size derived from the sire. *

The possession of a good form and desirable qualties is not all that is necessary to be noticed in selecting a bull for producing breeding stock. We have also to observe how far this character has been held by his parents. Cases are frequent in which *inferior* cows have been put to *first-class* bulls, and the produce has rivalled the sire for beauty and perfection; but such an animal, although possessing in an eminent degree the formation of body which is desired, is totally unfit for being used as a bull. Here we have the explanation of the fact that many bulls which are most pleasing to the eye are noted for throwing inferior stock.

The explanation is clearly this, that the maxim of "like producing like" is modified by another law—viz, that animals have varying

* A large male has a great deal of influence on the size of the calf, as well as of the young in other animals. Well-known instances occur in the dog and the sheep. The mothers are often lost if the disproportion between the male and female is too great. When small heifers are served with too large a bull, it is always attended with difficulty and danger.—J. D.

powers of hereditary transmission, dependent upon the degree to which certain peculiarities of character may have been concentrated within them. As I have before said, every successive generation "*in the line*" will possess, in a greater degree, the power of transmitting certain peculiarities; and immediately such an animal is crossed with a cow which has no such power, in consequeuce of *an irregular line* of descent, the bull exerts the greatest influence, and the progeny fully partakes of his character.

The quality of the produce is improved even more where this difference exists, than if a superior cow had been used. Lord Spencer noticed this many years ago. He says,* "It is admitted by every one that the qualities of the offspring are usually similar to those of the parents, either combining, in various proportions, the qualities of both parents, or taking entirely after one. I should say, as regards cattle and sheep, that in most cases the qualities of the male parent predominate in the offspring. I have also observed that the worse bred the female is, the more will this be the case when she is put to a well-bred male." This principle had been previously advocated by Rev. H. Berry in his celebrated Prize Essay on Breeding. It is therefore as important to see the parents of the bull as the animal itself; and no one pretending to any degree of careful breeding should neglect this point. Here we again observe the value of pedigree, which is so justly appreciated by short-horn breeders, who well know that any taint in the descent often reappears after several generations, to the prejudice of the stock.

An error is frequently committed by breeders of stock of *medium merit*, from not being particular as to the bull first used for their heifers, considering that as an heifer's calf is not generally desirable for stock, so it is not important to select a good bull. There is, however, little doubt but that the character of the bull *first* used gives an impress to the entire produce of that animal, even although later claves are got by other bulls. The *temper* of the bull should not be overlooked, for it is established beyond all doubt that this is hereditary in the stock, and it influences considerable difference on the tractability, as well as the disposition for fattening, of all the descendants.

[*To be Continued.*]

* *Journal of the R. A. S.*, vol. i., p. 24.

HINTS ON SEED SOWING.—A correspondent of the Gardener's Chronicle says:—"All flat seeds should be sown sideways, for, if laid flat on the ground they are apt to rot; and if this misfortune does not befall them, they never germinate so readily as those placed sideways. This accounts for so many failures amongst gourds, melons, cucumbers, &c.

From Highland and Agricul'l Journal of Scotland.

The Absorbing Powers of Soils, and of Roots of Plants for Manures.

BY R. RUSSELL, F. R. S. E.

Two remarkable papers on the above subjects have recently appeared, which are well worthy of attention—one in the *American Journal of Science* for July, by W. S. Johnson, Yale College;* the other by M. F. Brustlein, in the *Annales de Chimie et de Physique* for June. Both authors go over nearly the same ground, but the conclusions at which they arrive are very different in some respects. The paper by the last-mentioned author being the most original of the two, and throwing an entirely new light on the nature of the absorbing power of soils, we shall first direct the attention of our readers to the important truths which it reveals.

The experiments of Way, recorded in the 11th and 13th vols. of the *Journal of the Royal Agricultural Society*, made us acquainted with many curious and interesting facts regarding the powers that certain soils possess for retaining ammonia, as well as other substances forming the food of plants. These have been repeated by many other eminent chemists, which not only confirmed their accuracy, but seemed to homologate the more important theoretical conclusions at which he had arrived. It appears to us, however, that M. Brustlein has been successful in showing that the nature of the absorbing quality of soils is not due to the formation of compounds having little solubility, but is entirely due to the mere *physical conditions* of the soil.

Professor Way, as is well known, found that soluble salts of ammonia, or potash, in filtering through argillaceous soils, are decomposed. The bases of these salts are retained by the soil in an almost insoluble state, while the most of the acid is found in the filtered water, combined with lime or soda. The rapidity of the absorption of the alkaline substances by the soil is such as to resemble the ordinary union between an acid and an alkali. Different soils are operated upon, and it was found that all soils capable of profitable cultivation possessed the property in question, in a greater or less degree. Sand, however, did not absorb alkaline substances, neither did organic matters have the power of decomposing *salts* of am-

* November No. South. Planter, 1858, p. 674.

monia and of retaining the base. It was this last fact which led Professor Way to the erroneous conclusion that organic matters had nothing to do with the absorbing powers of soils. Pure clays, free from the ordinary salts of lime and soda, possess this power in a high degree, and hence it was inferred that the activity of the clay could only be due to some compounds of silica. The double silicates of alumina and potash or soda having the power of forming insoluble compounds with ammonia, were supposed to be the substances to which the absorbing properties of soils must be ascribed.

Henneberg and Stohmann, in repeating the experiments of Way, with the view of determining the most favorable conditions under which it is necessary to operate in ascertaining the absorbing power of a soil, found identical results. They have, besides, confirmed his observation, that absorption diminishes with the strength of the ammoniacal solution made use of; and that it is modified according to the relative proportions of the solution and the soil. These two chemists, indeed, have found the figures presenting so great a regularity, as to permit Boedecker to establish an algebraic formula for determining the amount of absorption, on the strength of the solution and the quantities of soil and liquid employed being given.

Liebig repeated the experiments of Way, and, confining himself exclusively to the properties of arable land, recognized that almost all soils, whether rich or poor in carbonate of lime or in alumina, possessed the same absorbing power. He ascertained, like Way, that this property does not manifest itself with the same intensity on all the bases—that potash was retained with greater energy than soda, while the whole of the ammonia was retained. The behaviour of alkaline silicate of potash with the soil was the same as the other salts or potash. The base was absorbed at the same time that the greater part of the silica was retained; and while the absorption of the different earths did not vary much, that of the silica appeared to be in the inverse ratio to the organic substances existing in the soil, which, having generally an acid reaction in saturating the earthy bases, such as chalk and magnesia, present obstacles to the fixation of silica. Soil taken from a forest, and rich in organic debris, mixed with lime-water until it was alkaline, and afterwards dried, absorbed a large amount of potash and silica. Liebig's experiments led him to the conclusion that the absorbing power of soils is due in part to the chemical action of the silicates, and of the hydrates of alumina on the silicates of potash, but that it partly *depends on the physical condition of the soil.*

In consideration of all these facts, Liebig also came to the same conclusion as Way, that the food of land-plants is always presented to them in a special form; that nature had given to the soil the power of absorption, for the special purpose of preparing the food of plants;—in short, that the soil so far subserved the ends of a stomach for the roots of plants. Both also came to the conclusion that this food existed in the soil in an almost insoluble state. Way, however, believed that it still possessed a degree of solubility sufficient to supply the wants of plants. Liebig, on the other hand, gives his assent to the doctrine (which we believe we were the first broadly to put forward) that plants must exercise a dissolving action, by means of their roots, on those substances which are so sparingly soluble in water. We have always thought that, although ammonia might be retained in the soil by forming combinations with the double silicates of alumina and potash, that this was not an essential form of the food of land-plants; that soluble food, under favorable circumstances, enables vegetables to develop themselves with greater rapidity, notwithstanding that they had also the power of taking up that which was scarcely soluble in water. The experiments, however, of Brustlein afford matter for considering this subject from new and various points of view.

Brustlein made his experiments at the suggestion of Boussingault, in the laboratory of the Conservatory of Arts and Manufactures. Three kinds of soil were first made use of, each possessing very different physical characters—1. A tenacious and compact clay, from Bechelbronn, rich in carbonate of lime, capable of retaining much water, and becoming very hard when dry; 2. Fertile loam, from the neighborhood of Strasburg, rich in carbonate of lime, and very friable; 3. A quartzose sand, rich in organic remains. In filtering an ammoniated solution through these different soils, it was found that the amount retained by any soil varied exceedingly with the strength of the solution. Such results were not favorable to the idea of chemical combination

in definite proportions. Experiments repeated with muriate of ammonia were still less so, for the absorptive power of the same earth, under the same conditions, presented a great regularity; but so soon as the strength of the solution varied it was no longer the same.

The quartzose sandy oil, rich in organic matters, but almost devoid of alumina, was found to possess a considerable power in fixing ammonia from its solution in water. This fact seemed to indicate that in this instance the organic matter or humus was the active agent. Some vegetable mould, taken from the hollow in an oak tree, was therefore subjected to experiment, when it was found to fix free ammonia from its solution in water. The mould, as well as peat, acted towards ammonia in exactly the same manner as arable land. These substances, in short, seem to have an action on ammonia identical to that of animal charcoal. They all possess, for the ammonia in solution in the water, an absorbent power in general superior to that of arable land; and Brustlein has the merit of making the discovery *that these substances are perfectly inert towards ammonia when it exists in solution as a salt.* This distinction, it appears to us, clears up the whole matter, in showing the grounds of the fallacious inferences of Liebig and Way. The inaction of such substances as peat and vegetable mould for salts of ammonia, is therefore no doubt attributable to the want of alkaline or earthy carbonates to decompose them, and set the ammonia free and permit absorption.

But Brustlein further subjected his hypothesis to a still more decisive test. A quantity of the calcareous earth from Bechelbronn was repeatedly washed with diluted muriatic acid, and freed from the carbonate of lime which it contained. The soil thus prepared preserved intact the property of absorbing ammonia in a free state from solution; *but entirely lost its property for absorbing salts of ammonia.* This inaction, he inferred, could not proceed from the destruction of any aluminous compound analogous to those of the silicates to which Professor Way assigned the special function of decomposing alkaline salts. This was rendered quite evident; for, on again mixing a portion of lime, in a minute state of division, with the soil which had been washed with hydrochloric acid, its absorbent powers for the salts of ammonia were restored. It is thus beyond doubt that the decomposition of an ammoniacal salt is induced by the presence of carbonate of lime or magnesia in a minute state of division, and that the absorption of ammonia by the soil belongs essentially to the physical constitution of arable land.

Brustlein further infers from his experiments that the ammonia absorbed by the soil is chiefly retained as such, being neither modified nor transformed into any nitrogenous compound. In the case of humus and peat, however, a portion of the ammonia is destroyed by an absorption of oxygen taking place, otherwise it appears to be retained by the soil somewhat in the same manner as the soil retains water, with this difference, that water is essential to this attraction taking place, or within certain limits it increases the power. A soil absorbs smaller quantities when it is dry than when it is moist. Air can be almost entirely deprived of its ammonia when made to traverse a long tube containing moist earth: but if in this case the air yields up its ammonia readily, it also carries the ammonia away with great facility when dried and passed over the moist soil. It is found, besides, that the ammonia which is fixed on filtering its solutions through a soil, does not possess a greater stability than when absorbed in the gaseous form. Moist earth exposed to evaporation loses, along with its water, a considerable quantity of the ammonia absorbed. A portion of the calcareous soil from Bechelbronn lost, upon drying in a room where the temperature was not higher at the end of the experiment than 12 degrees centigrade, more than half the ammonia which it had absorbed. After being watered and dried four times, it only retained about one-fourth of the quantity of ammonia. Nothing, therefore, it appears to us, can be more completely demonstrated than that the absorbing powers of soils are due to their physical properties. Brustlein assumes, though he has not tested the hypothesis by experiments, that potash and other bases are also retained by the same influences as fix ammonia.

The fact of the absorbing powers of the soil for ammonia being weaker in dilute solutions, has naturally led Brustlein to believe that a certain amount of ammonia can exist in solution and circulate within the soil. With Way, he imagines that the degree of solubility, though small, may yet be sufficient for the wants of plants, on the supposition

that they only take up their food in a soluble form. He has even shown that the retentive properties of soils are not so absolute in their nature but that the soil may be freed of its ammonia by repeated washings. He admits, at the same time, that the degree of solubility of ammonia in a retentive soil is very difficult to fix. One of his experiments shows that the ammonia is not absolutely fixed, but tends to diffuse itself equally over continguous portions of the same soil. A quantity of earth which had absorbed a portion of ammonia was put at the bottom of a flower-pot placed in a saucer, and another portion of the same earth, but free from ammonia, was put above it. The two were only separated by a thin canvass. On watering the whole from below it was found, at the end of eleven days, that about one-third of the ammonia had passed through the canvass, and diffused itself in the soil in the upper part of the flower-pot.

After all the experiments, then, which have been made of late years by Liebig, Way, and others, and misinterpreted by them, we are forced to go back to the doctrine put forth by Liebig in 1850, that the absorbent power of soils is the result of surface attraction. S. W. Johnson, in the paper already referred to, while still clinging to the idea of the action being chiefly chemical, supplies some curious facts to show that it is so far mechanical. His deductions, however, in a great measure lose their interest since Brustlein has given to the world the results of his decisive experiments. One point, however, he touches, which deserves from us some attention, regarding the manner in which plants take up their food.

We had formerly stated that the old doctrine of vegetable physiologists, that plants had no power of selecting their food, but merely took up what was in solution in the same manner as the wick of a candle, must be abandoned since Way's experiments showed that their food existed almost in an insoluble form in the soil. Since that time Liebig and many others have admitted that such must be the case, although they have not attempted to indicate how a function of this nature can reside in the roots of plants. Before the appearance of Liebig's recent *Letters on Modern Agriculture* we gave an explanation which was conceived to be most consistent with analogous phenomena.* In these Letters it appears to us that Liebig has served to complicate the whole question by supposing that the laws regulating the absorption of the food of land and water plants must be totally different. There is not the least necessity for such an hypothesis, as the same law that might regulate the one might also regulate the other. This weak point in the views of Liebig has already been commented upon by Brustlein, Johnson, and others, and arguments have been founded upon it to show that plants only take up what is soluble. The former remarks in his paper in the *Annales de Physique et Chimie*:—

In taking into account the small quantity of ammonia which exists in arable land, and its diffusion in the soil, though its solubility is extremely small—knowing, besides, that the reaction of the active alkalies, except the volatility, are identical to those of ammonia, it appears probable enough that plants choose the greater part of their food from dilute solutions, in which is found the nitrogenous element. It is not doubtful that it is so. Aquatic plants afford the proof of it, and the beautiful experiments of M. Boussingault have established that a plant acquires a complete development in a soil formed of pure sand and quartz previously calcined, having for manure nitrate of potash, phosphates, and alkaline ashes. Under these conditions the plant is then necessarily obliged to take up its food in solution.

The fact of plants thriving vigorously in sandy soils when abundantly supplied with moisture, has always been sufficient to convince us that the double silicates of alumina and potash were not, as Way assumed, absolutely necessary in preparing the food of plants. Nor are we to suppose with Liebig that what agriculturists term the "burning of young plants"† in sandy soils by concentrated manures, can at all be ascribed to their food being presented to them in solution. There are no evils arising from solutions, if sufficiently diluted. In rainy seasons, sandy soils are greatly benefited by applications of nitrates and ammoniacal salts, but the plants "burn" more readily with these applications in dry weather. The absorption of food being greatly facilitated when it is presented to the roots in a soluble

* *Journal of Agriculture* for January 1859.

† *Letters on Agriculture*, p. 38.

form, the increased supply demands a greater amount of water to carry on the functions of the plant in a healthy state. Plants do not "burn" so readily on clay soils, which have the property of fixing the ammonia in the soil, and only giving it up more slowly to the plant, and thus preventing all excess of nutriment. It seems, besides, that Sacho and Stoeckhardt have shown that the cereals and leguminous grains, as well as clover and beets. not only germinate, but attain a vigorous development, and even blossom, although their roots never come in contact with solid soil, but merely float in water holding salts in solution.

If Brustlein would just consider what is the *chemical action* involved in what he terms "the choosing of food" by the roots of plants, it might lead him to perceive that the same force which enables the Duckweed (*Lemna trisulca*) to select the particular kinds of food from solutions, might also enable land-plants to take up readily substances that are little soluble in water. His own experiments, indeed render the whole subject much more easily apprehended. W. S. Johnson, in attempting to explain the selecting power exercised by the roots of plants when growing in saline solutions, says:

But admitting that our analyses are sufficiently accurate to base calculations upon, and that the soil-water never contains more potash, for example, than river and well waters—viz. from 2 to 10 parts in 1,000,000—it must be remembered that the plant is by no means compelled to limit itself for its supplies of mineral matter to the water which it transpires. The root-cells of a plant placed in a saline solution at once establish osmotic currents, in virtue of the mutual but unbalanced attractions that exist between the cell-walls, the liquid of the cell, the surrounding liquid, and the saline and organic matters in solution in these liquids. The assimilating processes going on in the cells are constantly transporting matters forward into the newer growths, or else removing them from solution in the sap, and causing their disposition in a solid form. . .

. . As a result of this principle, the land-plant collects the potash, phosphoric acid, silica, &c., needed for its organization from the recently dilute solutions of these bodies, which form the water of wells or of the soil, just as the fucus gathers its iodine from the ocean.

This explanation of the absorbing and selecting functions of the roots of plants is very much the same as that which he gave in this Journal a few years ago.* We think, however, that Johnson's is deficient in simplicity, inasmuch as it introduces the equivocal action of osmotic diffusion, and which there is no occasion for taking into account at all. Neither the iodine of the ocean, nor the soluble food of plants in waters of irrigation, is brought to them by means of this power. Like the carbonic acid in the atmosphere to the leaves of plants, they are brought by currents; and as they pass over living absorbing surfaces, are fixed in the processes of assimilation. As we have already said in the paper just referred to—

Leaves cannot be said to *select* the carbonic acid and ammonia of the atmosphere, but they absorb these inorganic compounds by virtue of certain affinites which exist between them under the influence of light. The membrane which separates the cell-contents in the spongioles of the roots of plants from the inorganic world, is of a very delicate character, and we can have no greater difficulty in comprehending how it can absorb these inorganic substances, which may have special affinites towards organic matters in the cell-membrane or cell-contents, than that certain organic matters in the leaf attract and absorb carbonic acid under the influence of light.

In the case of water-plants, there are always agents in operation which produce a circulation of the solution among the roots. In land-plants the roots are constantly extending and coming in contact with fresh surfaces. Mr. Johnson considers that the absorption of poisons is abnormal, whereas we have always insisted that it is merely an illustration of the power as it is active in healthy absorption—chemical affinity.

On the former supposition—that ammonia, &c., existed in the soil as *insoluble compounds*—to which we were led by the more recent experiment of Way, Liebig, and others, considerable difficulties were presented in accounting for the absorption of nutritive substances. To these neither Johnson nor any other writer has alluded. If these compounds really only entered into the roots of plants by means of solutions, an action must necessarily take place which

* 1st October 1855.

osmotic diffusion could not possibly explain. The alumina and the silica which were not required by the plant, would be excreted by the roots on the assimilation of the ammonia. We thought that it was far more consistent with similar phenomena that the decomposition of the ammoniacal compounds should be effected by the affinity existing between them and the substances of the cell-walls or cell-contents. Like carbonic acid by the leaves, the ammonia would be separated from the other non-nutritive substances forming compounds with it, and drawn into the cells by chemical affinity. Silica, phosphoric acid, and some other substances, we still consider, are in this manner dissolved by the roots of plants and find their way into their structure.

In the new views which we are now forced to take of the absorbing powers of soils, the question of the action of the roots on ammonia and potash is greatly simplified. These, being merely adhering to the surface of the substances constituting the body of the soil, are by no means out of reach of the direct action of the roots of plants. The roots come in contact with them in forcing their way through the soil, and take them up by special absorption, in the same way as the leaves of plants do carbonic acid from the atmosphere. The principle of the diffusion of the gases in the atmosphere is not the most active means of bringing carbonic acid in contact with the leaves, although we might suppose it capable of doing so to a slight extent. The circulation of the atmosphere, in being constantly disturbed by winds, accomplishes this—the rapid bringing of the nutritive substances in contact with the leaves. So, in the soil, the roots are constantly extending in search of food; and the rains, as they descend, greatly assist in diffusing it equally over the absorbing surfaces.

That, however, the food of plants exists in the soil in forms so slightly soluble in water as to be totally incapable of being dissolved by it and supplying the wants of plants, has been forcibly put by Liebig:—

Let us assume that on a 2½-acre field 12,000,000 lb. of rain-water fall in a year, and that a third of this quantity dissolves from the soil the same ingredients, in the same proportions, as in the drainage-water analysed by Way. Let us further suppose that these 4,000,000 lb. of water are, during the months of June, July, August and September, completely absorbed by the roots of a crop of potatoes, and again evaporated from the leaves; then it follows that, on four fields of 2½ acres each, the whole crop of potatoes would not receive a single pound of potash; on two others of the same size they would obtain rather more than a pound; and on a seventh 2½-acre field, 2 lb. Now, from an average crop of potatoes on a 2½-acre field, there are obtained 408 lb. of ashes, in which are contained 200 lb. of potash.

Brustlein still refers to the experiments of Hales, as well as of Lawes, in support of the idea that plants may take up all the food they require in a soluble state. It ought to be borne in mind, that plants do not take up earthy substances in proportion to the amount of water that they respire. Indeed it is often quite the reverse—a circumstance which is the strongest argument in favour of special absorption, as well as the dissolving action of the roots. Plants perspire less when the dew-point of the air is high, and when evaporation is consequently weak. It is then, however, that growth is most active, and that the earthy substances must be taken up in the greatest quantity. For the same reason, mangold-wurzel, which resists drought better than turnips, can take up a much larger quantity of food in proportion to the water that it evaporates. So also in water-plants, in which the circulation of the fluids is so much slower than in land-plants; the food, being in solution, is especially absorbed by leaves as well as roots. There is no greater difficulty in accounting for the special absorption of the nutrient matters by the roots than that of the carbonic acid by the leaves from the atmosphere. Indeed, the chief nutrient matters are only retained by the soil by mechanical attraction or adhesion, while the roots have a chemical affinity for them. The weaker force merely yields to the stronger on absorption by the roots taking place. The vital force is a directing power, no doubt; but all changes, in both living and dead organisms, are effected by chemical affinity.

It is in the discussions of problems which lie just beyond those connected with the absorbent powers of soils, that the practical agriculturist is more particularly concerned. In order that plants should exercise those functions which we attribute to them, it is essential that the soil should contain no matters interfering with the healthy action of

their roots. Finger-and-toe,* clover sickness, and some other diseases, are evidently owing to certain conditions interfering with this dissolving and absorbing power of the roots of plants for their earthy food. This hypothesis is the means of affording an explanation of many obscure facts well known to agriculturists. We shall, however, merely mention one connected with the absorbing powers of soils to which both Brustlein and Liebig refer. The latter, in his *Letters on Modern Agriculture*, says:—"In many places the mud from pools, still waters, and miry bogs, is highly esteemed as a fertilizing agent. It is evident that such mud acts like arable soil, which has absorbed as much as it is capable of doing of the soluble elements of food or manure brought in contact with it." Now, although mud from pools may be valuable manure in some places where the soil abounds in calcareous matter, or where the climate is hotter than our own, yet it is well known in Scotland that mud, which has long been at the bottom of ponds, is sometime before it produces any fertilizing influence, even when laid on inferior soils in large quantities. All parties know that it is rich in the elements of fertility, but which, somehow, are found not to be available. It is said to be "sour," and the smell which it emits certainly shows that the organic matter it contains is undergoing a peculiar species of decomposition. The peculiar products seem to be inimical to the healthy functions of the roots of our cultivated plants. The elements of nutrition which the mud has absorbed from water are in all probability lying on the outer surface of the earthy particles; but the acid matter diffused through it does not permit the action of the roots of land-plants to take them up. The rootlets of the aquatic plants, not being injured by those products of decomposition, take up a full supply of nutriment, and produce a luxuriant vegetation of their own. The land and water plants both feed upon the same substances; but the particular form which the decomposition of the organic matter takes within the soil, has an influence sufficiently powerful on the functions of the roots of the land-plants to interfere with their healthy action.

So, too, in arable land; the organic matter which it contains is liable as it decomposes to produce different products. What is a healthy condition for the roots of one class of plants, is unhealthy for another. The different kinds of plants that thrive in running and in stagnant water are sufficient to demonstrate the influence of the two kinds of decomposition. In general, the use of lime on arable land is more for the purpose of regulating and controlling the particular form of decay of the vegetable matter, than for directly furnishing constituents for building up the framework of plants. It is a curious fact that has been little noticed, that a larger number of plants perish when sown on calcareous soils. A certain acid reaction in the decaying organic matter seems as necessary to the roots exercising their absorbing action, as is at least congenial to the plants that flourish in the sour mud at the bottom of pools. The common field-spurry is found on all light lands destitute of lime, and liable to the disease of anbury or finger-and-toe. Lime added in quantity, and allowed a certain time to act on the vegetable matter, is a preventive of this disease in turnips, and destructive to the growth of spurry. Facts at least show that the chemical conditions of the decaying organic matters in the soil exercise a powerful influence on the growth of plants, explain them how we will.

* It may here be observed that Liebig, in his *Letters on Agriculture*, while he has so far given his assent to our theory of finger-and-toe, mistakes, like many others, the peculiar disease itself. It is the forked or branched state of the roots which he describes as being cured by an application of lime. But this is mere degeneracy, and not a disease at all, in the strict sense of the term. Finger-and-toe, or anbury, we believe, is caused by the attacks of insects, which only touch those plants whose juices are in a corrupt state, owing to a want of earthy matter within the plant. Lime cures the disease by inducing such a decomposition of the vegetable matter as maintains the healthy functions of the roots.

Loss of the Cud.

Literally, there can be no such thing as "loss of the cud." Ruminating animals are never furnished with an appendage so ridiculous as a cud, to be used as "gum," in the mouth of a school-boy, which if lost, must be supplied, with an artificial "cud;" as if the operations of nature must be suspended until this prepared artificial panacea is supplied, to take the place of the natural "cud lost."

By a slight investigation of anatomy and

habits of ruminating animals, this very common delusion would be dispelled, and the slight understanding of the "cud," the causes of its "loss," and the means necessary to be used to restore it, would be more clearly understood.

By ruminants, or ruminating animals, we mean those having a complex stomach with four cavities so disposed as to allow of ruminating, or the act of at once laying in a large stock of food, slightly chewed, and afterwards to return it to the mouth, and there more thoroughly masticate it, and fit it for digestion. Digestion is always preceeded by this action in this order of animals, and they are exclusively confined to a vegetable diet. Now if debility, loss of appetite, disease of the stomach and digestive organs, or sickness from any other cause ensue, this order of nature may for the time be suspended, and the animal have no need to perform the act of rumination. The ordinary operations of a healthty animal are not called into requisition. Hence, we hear of "loss of cud." The only "remedy" for the "loss" lies in restoring the animal to health, and if we know what is the disease, we can the more certainly apply the "remedy." But all the "made cuds" that ever entered into the *materia medica* of quackdom can never compensate for the folly and ignorance of applying one.

The stomach of ruminating animals is especially organized for the performance of its peculiar functions. It consists of four distinct cavities, all communicating with a muscular canal at the termination of the *œsophagus*. Coarsely masticated food passes from the beginning of the muscular canal into the first cavity, called the *rumen*, or paunch. Water is received into the second cavity, called the *riticulum*, and almost exclusively occupies the honey comb cells of that cavity, and is gradually mixed with the coarsely divided food which is undergoing mastication in the *rumen*. When this is sufficiently advanced, a portion of the mass is raised into a muscular canal, is there moulded into a ball, and by a spasmodic action of the muscles of the gullet is forced into the mouth, where it is perfectly masticated at leisure, mixed with saliva, and again swallowed. It now passes directly into the third recess called the *psalterium*. Here the superfluous fluid is absorbed, and the thoroughly subdivided mass passes gradually into the fourth recess, called the *abomasus*, where it is completely digested and from which it passes off into the lesser intestines

Ruminating is a most interesting process of nature, and it is a most pleasing study to observe and note in its manifold operations, and to witness the supreme satisfaction of a well-fed animal "ruminating," or elaborating by this wonderful provision of Providence,—the mastication of food by deglutition, ejection and final swallowing—otherwise, "chewing the cud." When we become more thoroughly familiar with the beautiful economy of animated nature, and its most wonderful organization, we shall no more hear of the "loss of the cud," but will attribute the effects to their proper causes, and call things by their right names.

J. V. H. C., *in Gen. Farmer.*

Hot Tallow a Cure for Ingrowing Nails

We take the following remedy for a very common and very painful affliction from the Boston Medical and Surgical Journal:

The patient on whom I first tried this plan was a young lady, who had been unable to put on a shoe for several months, and decidedly the worst case that I have ever seen. The disease had been of long standing. The edge of the nail was deeply undermined, the granulations formed a high ridge, partly covered with skin, and pus constantly oozed from the root of the nail. The whole toe was swollen, and extremely tender and painful. My mode of proceeding was this:

I put a very small piece of tallow in a spoon, and heated it over a lamp till it became very hot and poured it on the granulations. The effect was almost magical. Pain and tenderness were at once relieved, and in a few days the granulations were all gone, the diseased parts dry and destitute of feeling, and the edge of the nail exposed so as to admit of being pared away without any inconvenience. The cure was complete, and the trouble never returned.

I have tried this plan repeatedly since, with the same satisfactory results. The operation causes but little pain if the tallow is properly heated. A repetition might in some cases be necessary, although I have never met with a case that did not yield to one application. Admitting the theory of Dr. Lorinser to be correct, the *modus operandi* is very plainly to be seen. The

quid cautery insinuates itself into every tertice under the nail, along the fistula to the ulcer at the matrix of the nail, ecomplishing in a minute, without pain, all at can be effected by the painful applica-on of nitrate of silver for several weeks.

From the Valley Farmer.

Flowers.

Beautiful things are the sweet, bright owers with which God has strewn our rthly home. Everywhere are they spring-g up along our pathway, gladdening our earts with their beauty and fragrance, aching us lessons of purity and innocence, d showing us the goodness, wisdom and ve of our Father.

They seize upon the affections of all. he old and the young, the learned and the nlearned, the good and the bad, all love e beautiful flowers. Their very nature is awaken and call forth the better and rer feelings of the soul. Great and good en and women, the high and the low, hool boys and school girls, have all studied em and written and sung their praises. hey have been called "the stars of the rth," "the alphabet of the angels," and rious other appellations equally significant d beautiful. The people of almost every tion and clime have worshipped them. he Grecian isles abound in rare flowers, d these the ancient Greeks scattered in e porticoes of their temples; with them ey adorned their altars and decorated the atues of their gods; they strewed them in e victors path and wore wreathes of roses their holy ceremonies, and at their ban-uets and festivals they crowned themselves ith them. Says a poet:

t was the custom there. to bring away
ie bride from home, at blushing shut of day,
eiled in a chariot, heralded along,
strewn flowers, torches and a marriage song."

Sunny Italy is a land of flowers, and its eople have in all ages loved and reverenced em. Madame De Stael, in her work en-tled Corinne, or L'Italie, represents her eroine in speaking of this country as say-g, "knew you that land where oranges ourish, which the rays of heaven make uitful with love? Have you heard the elodious sounds which celebrate the sweet-ess of its night? Reply, Oh! stranger, is ature with you beautiful and beneficent?" n Syrian lands it is said soft perfumes dif-fuse from every flower. In Hindostan the god of love is represented with his bow of sugar cane twined with flowers, his string, of bees; his five arrows each pointed with an Indian flower and he is called "God of the flowery shafts and flowery bow." The blooming vales of Japan are filled with gor-geous lillies and Japonicas, with flowers so beautiful that the females are named from them. In Turkey and some other countries the tulip and other flowers were formerly held very sacred and could be procured only at an enormous price. In our own happy land we may say they are worshipped, for have they not devoted to them the choicest spots about our houses? Do we not beautify our person with them, and ornament and render cheerful our apartments with their presence? Is not the bridal altar adorned with them, and do we not strew them in the coffins and plant them upon the graves of our departed ones, as tokens of our af-fection, as emblems of a renewal beyond the tomb?

Flowers, too, in all ages, have had their language, chaste and pure, the language of friendship and love:

"In Eastern lands they talk in flowers,
And they tell in a garland their loves and cares;
Each blossom that blooms in their garden bowers,
On its leaves a mystic language beams."

The hieroglyphics of the ancient Egyp-tians abound in floral symbols, and from hence we may surmise that the Greeks be-came accustomed to this figurative language. The Chinese have an alphabet composed entirely of plants and roots. Gothic books are full of emblems composed of flowers. We, also, of the present day, have books devoted to the use of the language of flowers; we exchange our thoughts and make known the sweet and tender sentiments of our hearts through them. It is a charming language, a delicate and pleasing way of expressing our affections, our sorrows and loves.

The study of plants and flowers is a de-lightful and useful one, it unfolds so many wonders and beauties, and affords so much instruction; the cultivation of them is also delightful and useful, developing mind, soul and body. Linneus, the great Swedish botanist; Humboldt, the great geologist; Tournefort, and hundreds of others have devoted their lives and interests to this study, have delighted in it, and through it

made themselves unspeakably useful to the world.

Spring at last has come among us in her gay attire and her warm sunny days are hastening on; soon the prairies, meadows and hillsides will be blossoming with the sweet, wild flowers; soon May day will come when at early dawn young men and maidens, boys and girls in innocent glee will be wandering over the meadows and climbing the hillsides to see who shall find the first spring blossoms. The Anemone and trailing Asbutus will be among the first and loveliest to greet them. In colder climes than ours they often show their sweet, modest faces ere the snow departs.

The opening Spring is the fit time to commence the study of plants and flowers, and their cultivation, and who have so good an opportunity as the farmer and his family, who have lands enough, and whose pursuits naturally lead to it? They should, one and all, father, mother, brothers and sisters, interest themselves in this pleasing employment. The time devoted to it would not be missed, and it would add much to the beauty, refinement and comfort of every farm-house. Particular portions of ground should be given to flowers and shrubbery of various kinds, and they should be laid out in good taste and well cared for. As this is the proper season, let me urge it upon the farmer's wives and daughters especially to give their bits of leisure to this employment. They can never regret time thus spent, nor happiness and instruction thus obtained.

SARAH.

Room Plants.

The present is an appropriate time to say a few words about growing plants in rooms. There are many persons without the convenience of a greenhouse, but in whom the love of plants is so strong that they will not be without them during the winter, even though they have to grow them in a garret window; and it is a happy circumstance that they can do so. We never pass a window in winter, with its few Scarlet Geraniums, and perhaps a pot of Mignonnette, etc., without thinking that there dwells within that house a soul full of the aspirations of a better life; and we can well imagine how many lonely moments have been lighted by the presence of these silent yet cheerful companions: the light and sunshine so essential to their own well-being they impart to those who care for them. There is a striking resemblance, in many respects, between women and flowers, more especially in the modesty, loveliness and sweetness which we are willing to concede to both; and we should naturally expect to find, and do find, as a general thing, that women have a nicer and more refined appreciation of flowers than men. Her organization, more delicate than that of man, intellectually and physically, fits her better to discriminate the finer shades of beauty. It should, therefore, excite no surprise to find among women the most constant lovers of flowers. Probably two-thirds of the flowers found in rooms are grown by women, and the number might be greatly increased with a corresponding diminution of that unnatural craving for excitement now quite too common. We know of nothing better calculated to beget home attachments than the love and culture of flowers.

We should be glad to do or say something to increase the number of those who grow room plants. It is true that plants cannot be as well grown in rooms as in a well-constructed greenhouse; but, notwithstanding there are some kinds that may be grown and flowered in a manner quite satisfactory, and with results highly gratifying. Certain conditions are necessary for the best success and these it is our object to point out. The greatest obstacle to success is dryness of the air: this may, in a measure, be overcome by a table suitably constructed, and the selection of plants best adapted to a dry atmosphere. The table should be the length of the window, and two or three feet wide, the boards being tongued and grooved. Around the edge nail a strip three inches wide, making the corners fit tight. The table is then to be filled with two inches of clean white sand. With a table of this kind, the foliage of the plants can be frequently syringed or sprinkled with water, which keeps them clean and promotes their health; the drippings and surplus water are caught and absorbed by the sand, and the floor of the room is thus kept clean; the sand, indeed, ought to be kept constantly wet, and even watered for this purpose, if necessary. The evaporation from the sand will diffuse itself among the plants and through the room, and thus overcome, in a small degree, one of the chief obstacles to the successful culture of plants in rooms. The table should be fitted with rollers, to facilitate the operation of watering

d cleaning the plants, and also for the
irpose of moving it back from the window
iring very cold nights. The flower-stands
common use are altogether unfit for a
om; the surplus water, dead leaves, etc.,
ll to the floor, injuring the carpet, and
ving the room an untidy appearance. The
ble above described is free from these ob-
ctions, besides having positive advantages
r the successful growth of plants which
ordinary flower-stand can possess.

All rooms do not possess equal advantages
r growing plants. A room with large,
gh windows, looking to the south, is the
st; the next best is one with a southeast
southwest exposure; next, east; next,
st; and least desirable of all, one looking
any point north. A large bay window
th a southern exposure possesses many ad-
ntages for growing plants, quite equal in
ny cases, and superior in some, to those
uctures absurdly called "plant cabinets,"
less the latter be intended for the preser-
tion of dried specimens, the only purpose
which most of them are fit. A basement
ndow, with a southern expose, will some-
nes answer tolerably well, but a room in
e upper part of the house is always to be
eferred. Having secured a table and
lected a room, the next thing in order will
a collection of plants; and here we would
op a caution against accumulating too
ge a number. Plants cannot be well
own anywhere, or under any circum-
nces, when crowded together; it is al-
ys more satisfactory to grow a few well
an to grow many indifferently. In making
list, we name only those which we know
succeed well in rooms, and which are
ast impatient of neglect and changes in
mperature. From our list of annuals given
st month may be selected *Schizanthus*,
belia, *Alyssum*, *Mignonnette*, *Mathiola*,
d *Ageratum*. Of perennials a good selec-
n may be made from the following, taking
em somewhat in the order in which they
e named: Geranium, (scarlet and sweet-
ented,) Primula sinensis, Azalea, Epiphyl-
ms, (indeed, the whole Cacti family,)
piræa Reevesiana and prunifolio, Roses,
uch as Hermosa, Agrippina, Fragoeletta,
.,) Heliotrope, Laurustinus, Bulbs, (such
Hyacinths, Narcissus, Crocus, Ixias,
abianas, &c.,) Calla, Oranges, Lemons,
euzia gracilis, Weigela rosea, Coronilla,
etunias, Cypripedium insignis, Hoya, (or
ax-plant,) Verbenas, Stevia, Euphne, Car-
nations Cape Jasmine, Pittosporum, Salvias,
Passiflora, Bouvardia, Fuchsia. We do not
recommend the young amateur to make so
large a selection, unless several windows
are fitted for the purpose of plant-growing,
or unless the selection is confined mostly to
one plant of a kind. A good selection for
a beginning would be a few pots of Alys-
sum, Mignonnette, Lobelia, Geranium, Pri-
mula, Azalea, Calla, Cacti, Coronilla, Helio-
trope Spiræa, Orange, Lemon, Petunia, and
some bulbs. It is better to begin in a small
way with a few kinds easily grown, and to
increase the number and variety as experi-
ence and skill are acquired.

We cannot, of course, within the limits of
a single article, give directions for the culti-
vation of the plants we have named; we can
only add a few brief remarks on their
general treatment. One of the most im-
portant things to be attended to is watering;
the plants should not be allowed to wilt for
want of water, but they should not be watered
till the surface of the pot becomes dry, and
then enough should be given to go entirely
through the ball of earth. The plants
should be frequently syringed and sprinkled
overhead, and kept clean, and free from
dead leaves. Extreme changes of tempera-
ture should be avoided as much as possible;
a moderately low temperature is to be pre-
ferred in a room to a high one; since, in the
absence of a strong and diffused light, too
much warmth will cause the plants to grow
weak. If the windows have curtains, they
should be kept up or drawn aside, and all
the sun and light possible admitted to the
plants at all times during the day. When
the weather is mild, the windows may be
thrown up for a while, or a top sash lowered
a little. During very cold nights the table
may be moved to the middle of the room;
and if the plants should unfortunately get
frozen, darken the room and throw *cold* water
over them repeatedly till the frost is drawn
out and then expose them gradually to the
light. In this way we have saved plants
when the ball of earth has been frozen as
hard as a brick. Room plants should not
be brought into the house till the nights get
frosty, and while out of doors they should
have a sunny exposure. Insects should be
looked after, and destroyed on their first ap-
pearance; a little attention in this way will
keep them free from such pests.

It has been objected to by some that it is
unhealthy to keep plants in rooms; but their

arguments lack coherence and force, and we are compelled to record our experience against the position. We believe them, on the contrary, to be conducive to health, not only by their soothing and cheerful influence on the mind, but as purifiers of the air, so that all may indulge their tastes without the least apprehension of injury to their health. We have no room for an argument here, but we believe that every vegetable physiologist will sustain our position; if he will not, then, in our opinion, he has something to learn. We commend room plants to all who have a room in which to grow them, and especially to the ladies, who are necessarily much confined to the house: they will cheer many a lonely hour, and afford balm to many a wounded heart. The world cannot seem utterly a blank while the love of flowers is left to console us.—*Horticulturist.*

From the New England Farmer.

70 Years' Experience in Farming.

MR. EDITOR:—Farming from youth to seventy years of age has not convinced me that it is a losing business. I shall not undertake to solve Mr. Pinkham's questions, since the old rule of practice is superseded by a rule which takes less figures, and herds-grass hay has taken the place of pod and bog-grass.

Such cows as I have kept for the last twenty years, nearly all of which I have raised myself, have consumed, by the steel-yards, an average of 20 pounds good hay per day, when in milk, and 15 pounds per day when dry. Twenty years ago, and many times since, I weighed for my cows, commencing two months before calving, and continuing four months after, as nearly as my cows came in together; of course, varying some one week to four weeks. Now I think I shall be allowing a full price for hay to call it 80 cents per cwt. in the barn.

20 lbs. per day for 6 months, or 183 days, is 3,660 lbs., at 80 cents	$29,28
Summer, 26 weeks, at 50 cents per week, is	13,00
	$42,28

If you please, add to this 5 pounds grain, at 1½ cents per pound, and deduct 5 pounds from the hay, the keeping for the year stands $48 69. Now, if I can get $48 69 from my cows per year, I shall lose nothing but taxes and interest, and I think I ca get even that, so that I can stand it on year more. I will say nothing about calves They are sold for about 50 cents to $1, a three days old.

Milk, for 6 months after calving, 8 qts. per day, at a yearly average of 3½ cents per quart, is	$45,7
6 months before calving, 4 qts. per day, is	22,7
	$68,4
Keeping	48,6
Profit	$19,8

If I have a cow that will not do as well a the above, I put her to one peck corn meal per day, and milk her till the butche wants her.

And now I want to tell you how much lose in raising my own cows. Within twent years I have raised seventy-one cows; a but four have been milked and proved But four of them have failed of makin good cows. I have about come to the lat Mr. Jaquith's opinion, "that a cow can b raised to order." I choose to have a calf t raise born in November to January. I le them take from the cow 4 quarts milk pe day, 8 weeks—56 days.

4 qts per day is 224 qts., at 3 cents per qt., is	$6,7
2 lbs. shorts per day, 127 days, at 1½ cts. per lb., is	3,8
1 cwt. hay, at 80 cts.	8
26 weeks' pasturing, at 10 cts. per week	2,6
This brings up the first year, and for the second year I give 20 cts. per week, 52 weeks, is	10,4
	$24,3

Now there is no more expense, for the cal is now a cow and will pay her own way, an at 3 or 4 years old will sell for from $40 t $60. I have raised calves without any milk but I find it best to begin with a good cal keep it well until it becomes a cow, an then keep well; and I can get what I ca good pay for all given calves and cows and $20, or more than that, on each cal and about that yearly on each cow. If young man can do as well as an old one, cannot see why he may not live by farming

OTIS BRIGHAM.

Westborough, Feb. 9, 1860.

The Bee Protector.

Within the year past, we noticed the in genious contrivance of Mr. Steele for ex cluding the bee moth, while the honey be

ıay have free access to her home and stores. Our excellent and *progressive* cotemporary, ıe Prairie Farmer, thought us something f a "drone" to believe that the "workers" ould pass out and in where the "moth" as excluded—or rather that the bee could ass this "protector" at all.

At the New Jersey State Exhibition last eek, Mr. Steele placed one of his *porticos*) a hive which he found on the Fair rounds, and the little fellows immediately ound their way in with their pellets of ollen on their limbs.

In noticing this invention, the Newark)aily Advertiser says:—

"An object of paramount interest to the ıpiarian is a little instrument for protecting ıe honey bee from the ravages of the bee ıoth, by means of very simply arranged alve doors, through which the bees pass in nd out of hives without any perceptible iffieulty, while the moth (a very feeble ıseet) is effectually excluded. When we onsider the value of the honey crop of the ountry, which amounts to upwards of thirty ıillions of pounds yearly, and how few of ur farmers keep bees on account of the isk from loss by the moth, we can imagine he value of a simple and cheap remedy. This is undoubtedly to be found in 'Steel's Bee Protector,' and we are glad to learn hat it is becoming appreciated as it beomes known, the proprietor having just hipped a large order for the South—the esult of a visit to the Fairs of Virginia nd North Carolina last fall. The inventor nd proprietor is Mr. Henry Steele, of Jersey City, who certainly deserves a handsome reward for the service he has rendered to this lepartment of science."—*New York Observer.*

Commercial Fertilizers.

By S. W. JOHNSON, *Chemist of the State Agricultural Society of Connecticut.*

SCALE OF PRICES.

The valuation of the chief ingredients of commercial fertilizers remains as in my First Report, and is as follows:

Potash.....	4 cts. per	lb.
Insoluble phosphoric acid..	4½	"
Soluble " " ..	12½	"
Ammonia..... ..	14	"

THE QUINNIPIAC COMPANY'S FISH MANURE.

In March, 1858, I was consulted by the Quinnipiac Company of Wallingford, Conn., with reference to a fish manure which they manufacture, and obtained their consent to publish the result of the analyses that were made. Nothing is more obvious than that the true interests of the manufacturer and of the farmer are identical, and equally promoted as well by an exposure of what is worthless, as by commendation of what is useful. The Quinnipiac Company employed me to analyze their fish manure in order to ascertain definitely for themselves, how it compares with standard fertilizers, and are willing that I should pronounce public judgment on it according to its merits.

The quality and price of the fish manure is such that it deserves to be commended to our farmers; especially since, as I am credibly informed, the Company bears a high reputation, which is a guaranty that they will continue to manufacture an article as good as they have submitted for analysis.

Analysis.

Water, - - - - - -	9.67	9.63
Organic (animal) matter, -	67.78	65.88
Sand, - - - - - -	2.05	1.96
Lime, - - - - - -	3.76	
Soluble phosphoric acid, - -	3.38	3.41
Insoluble " " - -	.81	.33
Ammonia yielded by animal matter, - - - - -	8.36	8.23
Calculated value, - -	$32.00 per ton.	
Manufacturer's price, -	$31.40 per ton.	

This manure is not so rich either in phosphoric acid or in ammonia as the best qualities of fish manure; but it is nevertheless entitled to a high rank among concentrated fertilizers. It yields fully one-half as much ammonia as the best Peruvian guano, and nearly all the phosphoric acid it contains is in a form soluble in water.

The calculated value is estimated from the prices adopted in my First Annual Report.

The manure is sold by measure. The Company inform me that it weighs 35 pounds, and is sold at 55 cents, per struck bushel. From these figures the price per ton, as given above, is reckoned.

The mechanical condition is very good. In employing this manure it must be borne in mind that, like Peruvian guano, it is capable of supplying only a part of the wants of vegetation, so that the use of some phosphatic manure and of leached ashes, muck or stable manure, with it, will be better economy in most cases than depending on it alone.

The manufaeturers reeommend to apply it to Indian eorn, for example, either broadcast at the rate of 20 to 40 bushels per acre or 3 bushels in the hill. It is doubtless generally the best plan to manure the plant rather than the soil, *i. e.*, if a crop grows in hills or drills, to manure in the hill or drill; if the erop is sown broadeast, manure in the same manner. If I understand rightly, a mueh larger applieation in the hill than three bushels per acre, is likely to prove detrimental.

It is to be hoped that this sueeessful attempt to manufacture a substitute for Peruvian guano in our own State, will meet with sueh eneouragement as to make fish manure a staple fertilizer. With the stimulus of abundant patronage, this kind of manure can be prepared of better quality and furnished at a less priee; while if judiciously used, it eannot fail to improve our lands permanently, at the same time that it yields better yearly crops.

THE GREEN SAND MARL OF NEW JERSEY.

In the Spring of 1858 I was informed that the "New Jersey Fertilizer Company" intended shipping to this State some eargoes of this material, and although I am not aware that their intention has been earried out as yet, there is apparently no reason why the Green Sand Marl may not become an artiele of eommere between Connecticut and New Jersey, and I therefore communieate to the public such aceount of its nature and use as I have been able to collect.

The Green Sand Marl is a peculiar geological deposit, met with in various parts of this and other countries, but most largely developed in the State of New Jersey, where it oceupies or underlies an area of 900 square miles. This tract extends from Sandy Hook south westwardly to Salem, on the Delaware River. a distanee of ninety miles, and is six to fourteen miles in breadth. It is only in a few localities, however, that it is found on the surface of the earth; it being overlaid with soil throughout the greater share of this vast distriet. It has long been known that this marl, as it is ealled, is exceedingly useful as a fertilizer when applied upon the contiguous lands. The discovery is said to have been made by aecident, and the effects were so striking, that in those parts of New Jersey, where it is easily aeeessible, it is now one of the chief reliances of the farmer.

The deposit of green sand marl has a variable thiekness, and is by no means uniform in appearanee. It often has a fine green eolor. The color is due to the *green sand* which is its eharaeteristic ingredient. Often, and indeed generally, the eolor of the marl is greenish-gray or brown, from an admixture of clay and other substances. The green sand itself oceurs in the form of grains like gunpowder. These grains are brown externally, if they have been exposed to the air, owing to the higher oxydation (or rusting,) of the protoxyd of iron eontained in them; but if washed or broken, their proper green eolor is always manifested This color enables us to distinguish the green sand from all other sands by the eye alone.

The green sand has a nearly uniform eomposition, and hence is considered a distinet mineral, and for the sake of distinetion is ealled *Glauconite* (which means "sea-green stone,") by the mineralogists.

In virtue of its composition and easy decomposability, green sand is an excellent fertilizer.

Its average eomposition in 100 parts is:

Silica,	49.5
Alumina,	7.2
Protoxyd of Iron,	22.8
Potash,	11.5
Water,	7.9
Lime,	.5
Magnesia,	trace.

On aeeount of its finely divided state, when freely exposed to the air and water of the soil it gradually deeomposes, and its potash, siliea and protoxyd of iron beeome soluble, or at any rate available to vegetation. The protoxyd of iron which is useful in small quantity, but detrimental if largely present in the soil, is prevented from aeeumulating to exeess by the faet that it rapidly absorbs oxygen from the air, and passes into peroxyd (iron rust.) The peroxyd of iron and alumina together with the siliea, are important means of inereasing the power of the soil to absorb and retain manures.

Many sandy and light soils are deficient in potash, and henee the green sand is useful when applied to them. It has indeed been supposed that this fertilizer owes its efficiency ehiefly to its large content of potash. The other ingredients that we have mentioned are, however, useful to a greater or less degree.

Not only the green sand itself, but likewise the other matters whieh, with it, make up the marl, must be taken aecount of in

considering its fertilizing value. The admixtures of clay, quartz sand, etc., are quite variable, ranging in quantity from 10 to 60 per cent. of the whole; thus more or less reducing the amount of manurial matters, and at the same time either improving or injuring the general composition by their own accidental ingredients.

The clay mixed with or overlying the green sand, in many localities contains quantities of a shining yellow mineral called iron pyrites or "fool's gold," which consists of iron and sulphur, and by exposure to the atmosphere is converted into sulphate of iron, (common copperas or green vitriol.) From this source the marl is sometimes so impregnated with sulphate of iron as to be destructive to vegetation when applied fresh from the pits. This difficulty is not, however, general, so far as I can learn, and in all cases is obviated by exposing the marl for a year or so to the weather, and by composting it with lime or with stable manure. By these means the iron is changed from the protoxyd to the peroxyd, which latter is harmless under all circumstances.

In some localities the marl is mixed with a large proportion of fragments of shells, and thus contains considerable carbonate and a small amount of phosphate of lime. Sulphate of lime or plaster, is also an occasional ingredient.

The following analyses copied from Professor Cook's Report on the Geology of New Jersey, clearly show the nature and extent of the variations in composition, to which the marl as employed for agricultural purposes is subject.

*Analyses.**

	1	2	3	4	5	6
Protoxyd of iron,	8.3	16.8	12.3		14.9	
Alumina, - -	6.1	6.6	8.0			
Lime, - -	2.4	12.5	1.0			
Magnesia, - -	.4	2.6	2.0			
Potash, - -	2.5	4.9	7.1	7.1	4.3	3.7
Soluble silica, -	20.2	31.2	45.9			
Insoluble silica and sand, - -	49.9	5.6	4.0			
Sulphuric acid, -	.9	.6	.4			
Phosphoric acid, -	1.4	1.1	1·3	.2	2.6	6.9
Carbonic acid, -	.2	9.3				
Water, - -	7.1	8.9	8.1			
Soluble in water, -	1.9	1.4	1.1	1.1	1.9	4.7

Potash it is seen ranges from 2½ to 7 per cent. The average is about 4½ per cent. One of the specimens is half sand and insoluble matters. No. 2 contains 12½ per cent. of lime, and 9 per cent. of carbonic acid, or 21 per cent. of carbonate of lime. Phosphoric acid is almost wanting in No. 4; but in No. 6 exists to the amount of 7 per cent. The usual quantity of phosphoric acid however, does not exceed 1 to 2 per cent.

From the composition of the green sand marl we might know that it is a good manure without any actual trials; but the experience of the New Jersey farmers during many years has so fully demonstrated its value, that the question arises—may it not be procured and transported so cheaply as to admit of profitable use in this State? The following quotation from Professor Cook's Report may serve to assist us in answering this question.

"The absolute worth of the marl to farmers it is difficult to estimate. The region of country in which it is found has been almost made by it. Before its use the soil was exhausted, and much of the land had so lessened in value that its price was but little, if any more than that of government lands at the West; while now, by the use of the marl, these worn out soils have been brought to more than native fertility, and the value of the land increased from fifty to a hundred fold. In these districts, as a general fact, the marl has been obtained at little more than the cost of digging and hauling but a short distance. There are instances, however, in which large districts of worn-out land have been entirely renovated by the use of these substances, though situated from five to fifteen miles from the marl beds, and when, if a fair allowance is made for labor, the cost per bushel could not have been less than from twelve to sixteen cents. Instances are known when it has been thought remunerative at twenty-five cents per bushel."

The New Jersey Fertilizer Company deliver the marl on board vessels at their wharf at Portland Heights, N. J., for seven cents per bushel. The bushel when first raised weighs 100 lbs.; when dry, 80 lbs. I doubt not that the average qualities of this marl are much better, bushel for bushel, than leached ashes. The best kinds are much superior, and in the inferior sorts there is much more weight of valuable fertilizing matters than in an equal bulk of leached ashes; but this advantage has its offset in the superior fineness, and consequent greater activity of the leached ashes.

*In copying the analyses, the decimals of the percentages have been abridged from two figures to one.

If then the expenses of transportation are small, as they are when large quantities are shipped, there is no reason why our farmers, who are located near tide-water, may not use this fertilizer to great advantage, especially if they can have a good article guaranteed them.

The marl is especially useful for potatoes and root crops, but on poor soils is good for any crop. It is applied at the rate of one to two hundred bushels per acre.

"ANIMALIZED PHOSPHATE OF LIME."

A specimen of the so-called "Animalized Phosphate of Lime," made by Hartley & Co., of Plymouth, Conn., received from Mr. Dyer, was analyzed with the following results, *per cent.:*

Water,	6.18
Sand and silica,	8.12
Organic and volatile matter,	8.61
Hydrated sulphate of lime, (unburned plaster,)	55.50
Carbonate of lime,	13.03
Magnesia,	1.77
Oxyd of iron, alumina and phosphoric acid,	1.76
Carbonic acid (combined with alkalies,)	1.03
Alkalies, chlorine and loss,	4.00
	100.00
Ammonia yielded by organic matter,	0.33 0.35

The analysis is not fully carried out, separate determinations of the quantity of phosphoric acid and of potash not having been made. The phosphoric acid cannot amount to more than 1½ per cent., the potash not more than 3 per cent. These quantities are of small account in a high-priced fertilizer. To finish the analysis in these particulars would serve no important use.

I find by a simple calculation that a manure equal, and indeed superior to the above, in composition and value, weight for weight, may be made after the following recipe:

60 pounds of ground plaster.
37 " hard wood ashes (unleached.)
3 " Peruvian guano.

Such a mixture can be manufactured at a profit for $10 per ton, and if I do not greatly mistake, most farmers can get the ingredients for $5 to $7 per ton.

This article claims to be "made from the bones, blood and flesh of animals, digested in acid liquors, and dessicated with various saline fertilizers, in such a manner that all the valuable gases and salts are retained in a dry powder." It is seen that the quantity of "various saline fertilizers," is so large compared with the "bones, blood and flesh of animals," that the result is comparatively worthless, commercially speaking. When we consider that 75 to 80 per cent. of a dead animal is water, it is easy to understand that it requires careful manufacturing to make a concentrated manure from the carcasses of horses, &c.

It is usual to employ oil-of-vitriol to decompose and deodorize animal matters in preparing manures. This is very well, but if a large quantity of cheap materials are afterward mixed up with the product, the value of the whole becomes so reduced, that the expense of manufacturing is a dead loss to the farmer who in the end pays for it, in case the manure finds a market.

If the sample furnished me represents the average quality of this manure, it may be confidently asserted that those who pay for it $50 per ton, (the manufacturer's price,) will lose the better share of their money.

PERUVIAN GUANO.

From the Store of Wm. Kellogg, Hartford.

Water,	17.22	17.41
Organic matter,	49 44	49.60
Total ammonia,	16.32	16.38
Phosphoric acid, soluble in water,	2.32	2.32
" " insoluble "	11.03	10.81
Sand,	1.90	2.07
Calculated value,	$61.20	

The above figures show that this fertilizer maintains its uniformity and excellence of composition to a remarkable degree.

The soluble phosphoric acid, it should be remembered, is equal in quantity to the average amount of this ingredient in our commercial superphosphates, and is accompanied with two to three per cent. of potash, which, though of trifling commercial value by the side of ammonia, is nevertheless of great manurial worth on the light soils where guano is most often applied.

ELIDE GUANO.

This is an article that purports to come from the coast of California. It is a genuine guano, similar, though inferior to Peruvian. It is afforded at two-thirds the price of Peruvian, and an analysis is of much interest as showing its real commercial value. It appears from the analyses of other chemists that this guano is quite variable in composition, at least, so far as the quantity of moisture is concerned. I give some of the

results of Dr. Stewart, chemist to the Maryland Agricultural Society, and of Dr. Deck, of New York, by way of comparison. I should say, with regard to its texture, that at first sight it is rather unpromising, containing some genuine stones and a good many hard lumps that are difficult to crush unless they are dried.

A mechanical analysis gave per cent.

Fine portion passing a sieve of 20 holes per inch,	74
Lumps easily reduced after drying,	22
Pebbles,	4
	100.00

When dried, however, the whole is as easily crushed as Peruvian guano, the pebbles of course excepted.

The analysis of the whole, rejecting the pebbles only, is given under I. Under II. are figures from Dr. Stewart's, and under III. from Dr. Deck's analysis:

	I.		II.	III.
Water,	27.34	27.60	18.90	22.64
Organic and volatile matter,	39.20	38.75	43.30	43.53
(Yielding ammonia,)	(10.00)	(10.06)	(9.39)	(11.46)
Phosphoric acid soluble in water,	5.07	5.31	11.00	
" " insoluble in water,	6.46	6.25		
Sulphuric acid,		4.94		
Lime,	9.67	9.36		
Potash and a little soda,		5.52	9.60	
Sand and insoluble matters,	2.50	2.52	4.70	3.24

Calculated value $46.60. or including the potash $50.

The high per centage of soluble phosphoric acid depends upon the presence of potash and soda.

It must be borne in mind that this manure is considerably variable in composition, and is so moist that it may easily deteriorate by keeping.

The specimen I have analyzed is considerably cheaper than Peruvian guano. It remains to be seen, however, whether other cargoes or other lots are equal to this, before the reputation of the Elide guano can be established.

SUPERPHOSPHATES OF LIME.

But four specimens of this manure have been analyzed this year. Two of these, I. and II., were from the store of Messrs. Backus and Barstow, Norwich; the others, III. and IV., from Wm. Kellog, Hartford:

	I. Pike & Co. av. 10 bags.		II. Coe & Co. av. 25 bags.		III. Greene & Preston.		IV. Coe's.	
Water, organic and volatile matters,	38.50	38.50	36.55	36.15	32.96—	32.28	40.85—	41.25
Sand,	28.85	28.80	2.70	2.80	2.45—	2.80	6.05—	5.95
Soluble phosphoric acid,	1.98	2.22	2.85	2.92	2.28—	2.43	2.62—	1.70
Insoluble " "	2.29	2.08	18.13	17.78	19.12—	17.64	15.76—	16.30
Ammonia,	2.44	2.45	3.14	3.11	1.39—	1.39	2.97—	2.74
Calculated value,	$14.00		$32.00		$26.31		$37.81 ₰ ton.	

I. Is seen to be a very inferior article; more than one-quarter of it (28 per cent.) is *sand!* This fact indicates that it is most probably some manufacturing refuse. The calculated value will give the farmer an idea how much he can afford to pay for it; but manures so largely mixed with sand, cannot be carefully prepared; and as other samples may contain much more sand, it is best not to buy this manure at all unless on an analysis.

II. III. and IV. are all fair samples of "superphosphates," as that word is now used, though none of them contain appreciably more *soluble phosphoric acid* than Peruvian guano It seems, as yet, impossible to find a real superphosphate (yielding 10-15 per cent. of soluble phosphoric acid) in the Connecticut market.

The above analyses do not accord very closely in some particulars. This is due to the fact that the samples were too moist to allow of intimate mixture. The slight differences are, however, of no importance in estimating the value of these articles.

All these specimens were in good mechanical condition. The first sample of Coe's superphosphate is of the same quality which

it has hitherto possessed. The analyses of it read almost precisely like those made last year; but there is some falling off in the other sample IV., in which the percentages of sand and water are both somewhat larger, and all the active ingredients are accordingly reduced in proportion.

The difference in value between II. and IV. amounts to $4.20 per ton.

Green & Preston's is still inferior to IV. chiefly from containing less ammonia.

CASTOR PUMMACE.

Messrs. Baker, Latourette & Co., 142 Water St., New York City, manufacturers of linseed and castor oils, have recently undertaken the new enterprise of importing the castor bean from India, and expressing the oil from it in New York. The cake or pummace remaining from this operation, has been found to possess valuable fertilizing properties, and is already employed as a manure in England. I have been employed to analyze the castor pummace, and it has turned out so satisfactorily, that in my opinion it will be doing the members of the State Society a service, to communicate the results, and do so herewith, having obtained permission of the manufacturers.

Analysis.

Water,	9.24
Old,	18.02
Woody fibre and mucilage,	38.29
Nitrogenous bodies (albumen, etc.,)	28.31
Ash,	6.14
	100.00
In the *ash* were found—	
Sand,	0.75
Lime,	0.36
Phosphoric acid,	2.04
Alkalies with a little magnesia, sulphuric and carb. acids,	2.09
	5.24

The amount of nitrogen in the nitrogenous bodies was found to be 4.32 per cent., corresponding to 5.48 per cent. of potential ammonia.

On account of the purgative effect of the castor oil, the pummace cannot be employed as food for cattle, and its whole agricultural value must consist in its fertilizing applications.

Its worth commercially considered, lies exclusively* in its content of phosphoric acid and ammonia. Its calculated value, using the prices adopted in my first annual report, viz., four and a half cents per pound for insoluble phosphoric acid, and fourteen cents per pound for ammonia, is $17.20 per ton (2000 lbs.)

The manufacturers inform me that hitherto they have sent the castor pummace to England, where it commands a price of £4 10s. sterling per ton (the English ton of 2240 pounds I suppose.) They now intend bringing it into the home market, and there seems no reason why we cannot use it to as good advantage as English farmers can, if it is afforded at a fair price.*

The pummace is not hard like linseed-cake, but easily crumbles to pieces, and is sufficiently fine to be convenient in application.

It belongs to what are usually termed the stimulating manures, and is rapid in action, usually spending itself in one season.

It may be applied directly to the soil and harrowed in, or used in the preparation of composts. I should judge it would be found exceedingly servicable in composting muck, etc.

Some caution must be exercised in the use of this class of manures, because their action is so powerful that in very heavy doses they may overforce the crop, or even destroy the seed when put in contact with it at the time of planting. It has been asserted that the content of oil of the oil-cakes hinders the germination of seeds, by preventing access of water to them. I am inclined to believe however, that their detrimental action is due to their readiness of decomposition, whereby the seed is caused to rot. In fact there are only a few instances on record of their occasioning this sort of injury, and in these they appear to have been applied in very large quantity. We can estimate the proper allowance per acre of castor pummace, by comparing its per cent. of ammonia with that of guano. It contains just about one-third as much of this ingredient, and accordingly we may safely use three times as much of it. We know that 600 pounds of guano per acre is

* The opinion has been entertained that oil is a fertilizer; but numerous careful trials made in England and elsewhere have proved that pure oil is quite inert, and only such impure oils as contain nitrogenous animal matters produce any perceptible effects.

* I see by the advertisements of Messrs. Baker & Co., that they sell castor pummace at from $12 to $16 per ton, according to the quality. It is a cheap manure.

a very large manuring, and 200 or 300 pounds is usually the most profitable in the long run. These quantities correspond to 1800, 600 and 900 respectively of castor pummace. I find that the largest doses of rape cake, (a manure of almost identical composition, rather inferior in amount of ammonia perhaps) given in English and Saxon husbandry, are 1500 to 2000 pounds per acre, while 600 to 800 pounds are the customary applications. More is needed on heavy than on light soils.

It is frequently urged as an objection to manures of this sort that they exhaust the soil. It is however always the crops that are removed, and never the manure applied, which exhausts the soil. The *exclusive* and continued use of this or any similar fertilizer will be followed by exhaustion; but by judiciously alternating or combining it with mineral manures, as wood ashes leached or unleached, New Jersey green-sand, superphosphate of lime, or phosphatic guano, it may be used with safety and advantage.

BONE DUST AND BONE MEAL.

These articles from the store of Wm. Kellogg, Hartford, have been analyzed with results as follows:

	Bone Dust.		Bone Meal.	
Water, - -	8.75	8.40	10.25	9.10
Organic matter,	27.25	27.27	26.02	27.55
Sand, - -	5.37	5.30	.10	.30
Earthy phosphates, -	45.32	45.32	57.39	57.13
Carbonate of lime as loss,	13.31	13.71	6.24	5.92
	100.00	100.00	100.00	100.00
Potential ammonia,	2.98	3.50	4.25	4.28

Of the bone dust a more extended analysis was made, in which the amount of phosphoric acid was determined with more accuracy than in the above analyses. It was undertaken on account of the high percentage of carbonate of lime, indicated, but not satisfactorily proved to be present by the first examinations. It confirms them as the following results show:

	Bone Dust.
Water, - - - - - - - -	8.75
Organic matter, - - - - - -	27.25
Sand, - - - - - - - -	5.37
Lime, - - - - - - - -	29.37
Oxyd of iron, - - - - - -	.52
Magnesia, - - - - - - -	1.16
Phosphoric acid, - - - - -	21.56
Carbonic acid (as loss, - - - -	6.02
	100.00

The bone meal is of the kind used for feeding, and is a very finely-divided white and pure article, consisting apparently of turnings of bone, and is well adapted for its purpose.

The bone dust is obviously ground from bones that have been boiled or steamed to extract their fat, and have also parted with a portion of cartilage (animal tissue,) as is evident from the small percentage of potential ammonia.

In the collection of the bones, no great care has been taken to remove adhering dirt and sand, for we find more than five per cent. of this impurity. There is also thirteen and a half per cent. of carbonate of lime, which is more by five or six per cent. than is usually found in steamed or boiled bones. When we compare the composition of the dust with that of the meal, the latter representing pure bone, we find that there is a difference of twelve per cent. of phosphates (nearly six per cent. of phosphoric acid,) and one and a quarter per cent. of potential ammonia. Doubtless there has been no intentional adulteration practised on this bone dust; but it is not quite so pure as it ought to be. The sample is hardly so fine as to deserve the name of *dust*, as it contains a good share of unground fragments. Few of these, however, would not pass a sieve with eight holes to the linear inch, and it is therefore in a good form for use.

A few words with regard to the use of bone meal for feeding. When employed for this purpose, bone meal is intended to supply, especially to milch cows, the lack of phosphates in the food. It appears pretty well established that the soil of many pasture lands may become so exhausted of phosphoric acid, that the herbage does not yield to cows, enough of this ingredient for the proper nutriment of their bony system, and at the same time supply the large demand for phosphates made by the milk secreting organs. Cows thus poorly fed, turn instinctively to the proper remedy, and neglect no opportunity to gnaw upon any old bones they may be able to find. The results of continued feeding on such poor pastures, are a loss of health on the part of the cows, especially manifested in a weakening or softening of the bones—the *bone disease*, that is not now uncommon in our older dairy districts. It is found, if we may rely on the experience of our best farmers, that this evil "can be partially remedied by directly feed-

ing finely ground bone meal to the cows." Other phosphates have been found to answer the same purpose, and doubtless the cheapest materials for this purpose are some of the "rock guanos" now common in our markets. The true remedy for bone disease, however, consists not in dosing the animal, but in so improving the soil that it shall produce a perfect food. A liberal application of some phosphatic manure is the obvious resort in extreme cases where the soil is absolutely deficient in phosphoric acid; but in my opinion there are few soils in New England (always excepting mere sand barrens) that do not originally contain enough of all the mineral food of plants, to yield perfectly nutritious fodder for an indefinitely long period, without the necessity for outlay in commercial or concentrated fertilizers, if they are brought into the proper physical conditions and manured with all the dung and urine that can be produced on them.

For the Southern Planter.

Experiments with Plaster on Pea Fallow.

I last year had 2 bbls. plaster, (all I had,) sown on a part of my pea fallow; the plaster was applied to the poorest and lightest part of the field at the rate of half bushel per acre, the peas had about 6 or 8 leaves at the time the application was made. In a few weeks the vines were a much deeper green and were much more flourishing than those adjacent without plaster. The whole field was fallowed and put into wheat at the usual time. About the 1st of January, the wheat on the plastered portion, began to take the start and maintained it up to harvest; and when cut, I think was fully four times as good as the balance of the field, notwithstanding the pea vines were twice as good on some richer parts of the field, where there had been no plaster. The joint-worm fly seemed to attack the unplastered wheat to the very row where the plaster stopped. I did not thresh or measure the product separately, but all my neighbors who saw the crop when growing, I am sure, will concur with me in the above estimates of the product. The growth of weeds, &c., on the land since harvest, distinctly mark the boundaries of the plastered portion.

I have applied plaster to the whole of my pea fallow (130 acres) this year, and have the best growth of vines I have ever had. On portions of the fallow, not plastered, to see the difference, I think the growth is scarcely one-fourth of what it is on the same land alongside of it with the plaster.

On a part of the fallow I applied 1 bushel per acre, on the last sowing, about the 1st of July, I applied half bushel plaster and half bushel leached ashes, wel lmixed together I can see no difference in the pea vines. If plaster will act as well on all lands, I think we may save the expense of buying guano in future. I have frequently used guano, but have never seen the best Peruvian produce so fine an effect as this small application of plaster on pea vines has produced this year. The land on which the experiment was made, is light Mattaponi land, well adapted to corn, but rather too sandy for a heavy crop of wheat.

ED. HILL.

King William County, Sept. 18th, 1860.

SLABBERING HORSES.—A correspondent of the Boston *Cultivator* says: "All grazing animals, and the human species are at times, troubled with it, and the cause is probably very simple, and the remedy should be so. In a healthy state, the stomach of all animals abounds with a due proportion of acids and alkalies, which aid in forming the gastric juice, which dissolves and digests the food. When acid too much prevails, it deranges digestion and causes, too much moisture on the stomach. All that is wanting for a cure is alkali and carbon to neutralize or absorb the excess of acids. Give the horse, in his feed, about half a pint of pulverized charcoal one day, and soot the next, and he will soon be well. The charcoal absorbs acid, and carries it off. Soot neutralizes acid. The operations of the two will restore the gastric juice, and then all will be well. We have several alkalles besides what may be in soot, but none so safe as in soot, for any quantity given will not hurt the stomach. Slabbering in horses is undoubtedly caused by some improper thing eaten.

GOD NEVER PERPLEXED.—It is a glorious truth that God rules, and that he knows what is to come out of all conflicts. He sees the end from the beginning. His purposes will be accomplished, whoever else may be disappointed. His purposes are all right, and ought to prevail. The Lord ruleth, let the earth rejoice.—*Dr. Cox.*

Richmond Female Institute.

From the Southern Lit'y Messenger.

Among the many unmistakable evidences of prosperity and progress which Richmond now affords, none is more decided, or more gratifying, than that evinced by the number and character of its institutions for the education of young ladies. A glance at the crowded advertising columns of our city papers, at this period of the year, will soon reveal the fact that the interest felt in this subject, and the activity manifested, are of no ordinary kind.

The Richmond Female Institute, a cut of whose building we present above, is one of the largest and best known of these institutions, and the only one, we believe, that is not strictly a private enterprise. It occupies a beautiful lot fronting on 10th street, and extending across from Marshall to Clay—a quiet and retired yet central spot, fitly chosen for such a purpose. The building is in the form of a T, with a depth along the stem (not shown in the cut,) of 100 feet, and a front of 125 feet, to which two wings of 30 feet each are to be added to complete the plan.

This institution originated in the felt want, on the part of some of our citizens of facilities for the education of their daughters, considerably above any which were then within reach.

However excellent and numerous the private schools might be, they were seen to be liable to fluctuations and uncertainties—rising or falling with the personal popularity of the proprietor, varying in the advantages furnished with his varying pecuniary success, and thus scarcely able to offer any large and settled course of study, or any invariable standard of graduation.

It was determined, therefore, to establish a Female College, to be equal in grade to the best of our Colleges for young men, and to be located at Richmond, which seemed to offer almost unequalled advantages as the place for such an institution.

In order to enlist in its behalf the sympathy and support of as large a number as possible, and with a view too, to the pecuniary profits which it promised, it was decided to raise the necessary funds upon the joint-stock principle, and to collect them from different portions of theState.

Accordingly, a charter was obtained in March, 1853, incorporating a Board of Trustees, and authorizing them to raise on this plan, not less than $15,000, nor more than $100,000. Its provisions are unusually liberal, vesting all authority directly in the Trustees, and giving to the Institute the powers and privileges of a College.

Under this charter about $50,000 were raised in shares of $50 each, a most eligible lot was purchased, the buildings erected almost as if by magic, an extensive and costly apparatus secured, and all the appertenances supplied in liberal abundance. All the arrangements were on a most magnificent scale; and yet, with so much dispatch was the whole conducted, under the direction of the President, Rev. B. Manly, Jr., that the institution was opened in October of the same year, and be-

fore the close of the session, nearly two hundred pupils had been entered.

The Faculty was large and of unquestioned ability; the Course of Study was extensive and complete; and the number of matriculates unexpectedly great. The enterprise sprang forth in full-grown strength. By its system of independent schools, it was able to send out the very first year, a number of young ladies, previously well trained by others, as its graduates, and by the success and brilliancy of its Commencement, to attract wider notice and win increased favor. The next year a still larger number of pupils were in attendance, and up to the present time, the average for the six years of its existence has been somewhat over two hundred matriculates.

In its *literary* aspect, the Institute has been eminently successful. While but few young ladies (only four) have been able to complete fully its extensive course, yet many, very many, have left its walls with a degree of mental and moral training, that, whether in the social circle or in the school room, must do honor to their Alma Mater and widen her beneficent influence. Nor can it be questioned that indirectly also, in its effect upon other schools, whether previously existing or established more recently, it has done much to elevate the standard of female education, both in Virginia and elsewhere.

As a *pecuniary* investment, like many other joint-stock enterprises, it has not met the expectations of some of its founders. The sum expended (about $70,000) being much larger than was anticipated, a balance of debt was left to stand in the way of present dividends. We have little apprehension of pecuniary embarrassment. Noble men, with liberal minds and ample fortunes, have done much for its origination and support, and we feel assured that they are ready to do yet more when more shall need to be done. And yet we could wish to see the money making idea wholly dissociated from the enterprise. The yearly income might then be devoted by the stockholders to the promotion of its enlarged usefulness, an endowment fund added if necessary and the Institute placed fully upon the broad basis of our male Colleges.

A brief reference to the Course of Study, is all our limits will allow further. The plan is unusually comprehensive. It proposes to begin at the beginning, with the elements, and to include and exhaust, as far as practicable, every branch which should enter into a young lady's education. There are three departments, designated respectively as Preparatory, Collegiate, and Ornamental; each having its distinct officers, while all unite and harmonize under the direction and supervision of the President.

The first of these, whose name sufficiently describes it, occupies three or four rooms apart from the rest in the lower story of the building, and is in charge of several ladies who give it their exclusive attention.

The second—the Collegiate—occupies the first floor, with its large Study Hall and six or seven recitation rooms. The studies of this department are divided into seven distinct "schools" after the plan, somewhat modified, of the University of Virginia. These are: 1. English Language and Literature; 2. Ancient Languages; 3. Modern Languages; 4. Mathematics; 5. Natural Sciences; 6. Moral Philosophy; 7. History and Political Economy.

Concurrently with this division, however, a partial arrangement into classes is likewise maintained, in the belief that a union of the two plans is better than either alone.

Instruction in this department is given by male Professors mainly, with two or three ladies in the lower classes.

The Musical and Ornamental department has also a full corps of teachers, and embraces all the branches usually included under that head.

The Institute is now under the Presidency of Mr. Charles H. Winston, who was appointed to that post at the beginning of the last session. It is gratifying to observe the indications of progressive usefulness and enlarged success which it affords. With the prestige of the past, and the encouraging propects of the present, we can confidently predict for it a brilliant future, which shall claim a yet brighter page in the annals of female education.

What may be Learned from a Tree.

[The following article is extracted from a very interesting book from the press of D. Appleton & Co., by Harland Coultas, author of "Organic Life the Same in Animals as in Plants, &c., &c." It is entitled "What may be Learned from a Tree," and will prove a rich treat to the reader who has a taste for deducing moral lessons from natural science—who

"Finds tongues in trees, books in running brooks,
Sermons in stones, and good in every thing."]

And now, reader, imagine yourself seated with me beneath the shade of some grand and glorious old tree. I am going to let you into the secret of a few bright, guiding thoughts, which cheer me along through life. Spring has covered this tree with another generation of bright, green leaves, all of which are at work on its fabric, and usefully employed. They will soon pass away, and others will take their place, for Nature knows no backward movements. How many such generations of leaves have already expended life in building up this tree!

Reader, your position and mine on this earth resembles that of the leaves on this tree. We are only here for a little space of time. Many generations have preceded us, and coming generations will soon take our place. The wise and good of all ages have been trying to improve this world and its inhabitants, and, as the result of their labors, we have now a social organization called civilized society. There certainly can be no question as to the necessity of further improvements. These must be founded on Nature. Whilst we live, then, let us employ ourselves usefully, and help to diffuse science, peace, prosperity, and contentment. Let us try to build up a noble social tree.

If we study the economy of labor amongst these leaves, we shall find that they "help each other along." The lower leaves on the shoot, for instance, prepare the sap or nutrient material for the leaves above them, the little twigs assist to develop the branchlets, and the branchlets aid in the growth of the branches. In point of fact, the whole tree may be regarded as a "Mutual Aid Society;" and thus should it be in this world.

The tree is all the time changing its form, and in like manner society is ever changing its aspect through all its ramifications. Through want of life-energy and industry, some are losing gradually that social position to which they were elevated by their ancestors. They are rapidly losing the sap* for which all are contending. This is now being diverted away from them to other channels, to individual shoots and branches, where there is more vital activity, for sap is always attracted to these parts; these stranger shoots are becoming more and more conspicuous in the social tree, and will soon overtop and conceal them. It is thus that the rich sometimes become poor, and the poor rich.

But there are other causes which effect great social changes in a community. Sometimes the form of a tree changes in consequence of storms; its branches are broken off by powerful winds. And what man is sure for one moment against calamity! This is so well known, that the words "in prosperity prepare for adversity" have passed into a proverb. How frequently have the fruits of years of toil and privation been lost in a single hour!

* Sap or dollars—that circulating medium so necessary to the development of individuals and societies in civilized life.

It has, however, been shown that the injury done to the tree is soon effaced, that when branches are thus removed, those less developed get the sap which they monopolized. And does not precisely the same law obtain in society? If any body suffers in person or pocket, somebody is sure to benefit. Hence the force of the old Scotch proverb, "Its an ill wind that blaws naebody ony luck."

But the most remarkable and interesting feature about a tree is the fact that it is a body so easily impressible. All its periodical changes from a state of rest to that of motion, those waves of growth of which we have spoken, have left an indelible impression in the solid parts of its fabric. All the bright and stormy days of its life, every wind that has shaken its foliage, and every rain-drop that has wetted its roots, have helped to mould its physical organization and make it just what it is. We see, however, that in the figure of its leaves, the form of its branches, and the colour of its flowers, it is governed by peculiar laws of life impressed on the seed, and that it possesses an internal organizing power by which it can, to a certain extent, form itself, notwithstanding the indelible impressions left on its organization by the events of its life.

And is it not thus with the successive generations of man? Like the flowers of the field and the trees of the forest, do not we all develop according to the same general laws, running through the same cycle of life-changes—of infamy, maturity, decay, and dissolution? Yet each individual is governed by a peculiar specific law. Is there not an individuality about each of us? Hence, like the plants around us, do we not possess, to a certain extent, an organizing power within ourselves? Like the trees, we are inseparably connected with the material world from whence our organization derives impressions. We are a part of the Universe. The matter of which our bodies are composed, like that of trees and flowers, is held together by attraction, and after a while, like them, the present living generation will disappear from the landscape—dissolved into earth and air. But not an atom perishes. The same matter again reappears in other forms of life and beauty. It is not the first time that the matter which composes the present living organized creation has been vitalized. How, then, can this grand machine of Nature be without

guidance? Who will say that there is no plan or system in this thing? Is it not also plain, that we are connected with the past and future in adamantine chains, and that the species of independency and separation from external nature, which we attribute to ourselves, is a mere figment?

And if matter is thus imperishable,* then gravity, heat, light, electricity, (those forces which control matter,) are also eternal. And why should not mind be immortal—mind, the highest force in the Universe, which now guides the lightnings, and to form and advance which is the design of this vast system of sea and land, air and skies? It is natural for a noble mind to desire immortality. But if man is not immortal, then a nation weeps in vain for its mighty dead, and erects its noblest cenotaphs. Where will they be when the perpetual beat of ocean shall have shattered to ashes these continents and the Alps and the Andes, those majestic monuments of Nature lie entombed under its rolling waters? Matter and the forces which govern it are eternal, and human life (I mean that life which we have in common with plants), is a mere integral† portion of eternity; yet, why doubt the immortality of that higher manifestation of life called mind, when it can sweep over the vastness of Nature and unfold the principles of things? If the value of man is to be estimated by the duration of his frail and perishable body, then is he of less importance than the tree which he fells for timber, for that frequently outlives him and his successive generations. Oh, let us not think thus meanly of ourselves! The mind is the man; and "one living mind is worth more than a dead Universe." Never can I sympathize with those who seek to inspire man with low, reptile feelings, and try to shame him out of his trust in his Creator! What moral good can ever result to the human race from the advocacy of such sentiments?

I see the sun now sinking in the west. He is casting his parting rays on our landscapes. How beautiful the light reflected from the clouds in his neighborhood. Another beat of the great pendulum of the Universe! Whence that thought? It rises from my appreciation of the advance of Nature. The landscapes are now enveloped in the earth's shadow. It is night. Why did that sunset give me so much pleasure? Because the sun was made to minister to my gratification. I am then of more importance than that sun. Yet it shone myriads of ages before I came to regard its splendors, and it will shine on my lowly grave. *That will contain my body*, BUT NOT ME. Others shall look on thy setting beauties, thou glorious sun, and read these lines when I am gone, and oh! may they inspire in them my own unfaultering faith in Providence and immortality!

As the tree is connected with the material world, and receives impressions from without, which mould its character, so with the organism of man. He is bound by inseparable ties to the material creation. Locke, in his "Essay on the Human Understanding," has shown us the nature of this connection: that sensation links us with matter, is the germ of intellect, and the avenue of human knowledge.

Notwithstanding the unbounded liberty which the mind of man seems to possess, it is in reality confined within very narrow limits; for when we carefully analyze our ideas, simple and complex; we can trace them without an exception to past impressions made on our organization. We can form no conception of anything without reference to ideas previously acquired by the senses. I may conceive of a golden mountain, but it is obvious that if I had not previously acquired, by impressions from external Nature, the ideas of mountain and gold, it would have been impossible to have formed the combination.

We are very frequently compelled to re-

* There is not now, and, in the author's opinion, never was, a chaos, or state of things in which the atoms of material bodies were heterogeneously disposed. All the researches of science tend to show that matter has always been subject to law. It is not impossible for the matter of our earth to have existed in some other form anterior to its attraction together about the earth's centre, and when the earth shall have answered the purposes of its Creator, when she shall grow weary in her diurnal march, and the ocean roll its last billow, the winds breathe their last gasp, may not the matter of the earth, like that of the beautiful trees and flowers which have disappeared from its surface, still be in existence, and reappear again in some other form to beautify the heavens and go through another grand cycle of change?

† Integral, the sum of a series of differentials or infinitely small quantities. The moments of human life are in differentials, and human life itself is that sum or integral.

ceive ideas independently of our will. I may, for instance, be looking out of my window, and see a man shot down, and a year afterwards recollect the circumstance. I have thus involuntarily acquired an idea. Impressions thus received, when powerful and painful, will recur again and again, and influence our conduct through life.

Now, if our knowledge of an external object was limited to the moment of perception, and was extinguished forever with the fading sensation which gave it birth, if we had no memory of past impressions, then we should be creatures utterly incapable of reasoning or reflection. But we are so constituted that the knowledge derived from without lives within us. All our past impressions are secured to us. They are associated together according to certain laws, which have evidently been contrived with the most admirable adaptation to our wants, so as to bring again the knowledge previously acquired by the senses at the very time when its return is the most profitable. "A burnt child fears the fire," for example. Hence we are ever expanding ourselves over the long series of our past sensations, for memory is the mind relapsing into a former state, and the use of reason becomes more and more apparent, as these sensations from the external world are increased in number and variety.

How beautifully are the upper and lower extremities of a tree organized with reference to the earth and atmosphere! The fibres on the roots and the leaves on the branches—how different in form and color! Yet both are absorbents beautifully adapted to the media in which they develop. In like manner is the organization of man adapted to the material creation spread around. His eye is beautifully adapted to receive the light, his ear is formed for the reception of sound; his body, in fact, is an apparatus most exquisitely contrived to render him sensible to the nature of external things. Hence, Nature is the great teacher. In childhood we are the most passive and impressible. We spend life in a state of constant and curious excitement. We are perpetually stimulated by the presence of new objects, and every hour brings with it stores of facts and natural appearances, the rich materials of our future knowledge. Nature is pouring in instruction at every avenue of sense. As we advance in years, we become familiar with common objects, and our attention is naturally drawn away from the discovery of what is new to the study and examination of that which is old. The vast variety of phenomena which have made an impression on us are brought under review, and the feverish astonishment of childhood gives place to the color of manly contemplation. Then commence those first attempts at generalization, which mark the dawn of science in the mind, and from the lessons of the past we now draw the materials of our future wisdom.

Every wind and rain-drop has helped to mould the character of this tree. And it is a great truth, which well deserves to be regarded, that not only the peculiarities of their organization, but the circumstances by which they are surrounded, form those endlessly diversified varieties of human character which we meet with in our passage through life. Like the different trees of a forest, the individuality of men is the result of the controlling influence of peculiar laws of organization and the circumstances in which they are placed.

The tree unfolds from the seed and runs through all the various phases of its life, according to peculiar laws which are ineffaceable, and can never be set aside by circumstances, adverse or otherwise. And, like the trees and flowers, human nature exists under a vast variety of form. We differ from each other, not only in our features, but in our tastes and modes of thought. These differences of character are constitutional, the result of the operation of those peculiar laws of life which have governed us from the commencement of existence. The variety of talent and disposition is a wise and benevolent provision of Nature. It brings men together. It enables them to be of service to each other, and thus strengthens the bonds of mutual dependence, respect, and good-will. Since, then, human nature is so constituted, it shows not only ignorance and narrowness of mind, but a want of courtesy and even common sense, to cherish unkind feelings towards any man for a mere difference of opinion, or a want of sympathy with us in our favorite pursuits. On the contrary, charity and forbearance are indicative of a mind enlightened, expanded and noble. It is an endorsement of the fact that its possessor appreciates freedom. We cannot all think alike. There are natural antipathies and mutual attractions. If the former were not a reality, the

latter could have no existence, and life would be without some of its choicest blessings—the sweet sympaties of mutual love, and the warm and appreciating grasp of the hand of friendship.

A tree cannot flourish in an unfavorable soil, however healthy the germ which the seed encloses. So a man may be richly endowed with natural talent, and yet that talent will continue rudimentary, and ultimately become abortive through the long continuance of unfavorable circumstances. These facts ought ever to be borne in mind, if we would form a just appreciation of others. The first duty which a man owes to himself is to develop himself. Circumstances form character. "He that walketh with wise men shall be wise, but a companion of fools shall be destroyed." There must be an affinity for what is true and noble, and then there will be progress. We may extricate ourselves from an unfavorable position. By honorable, right-angled or upright behaviour, we may awaken sympathy in the bosom of the wise, the just and the benevolent. We may impress them favorably, and they will necessarily become our friends. It is a law of Nature, that virtue and integrity shall have their reward. Is not this a plain indication of that pathway through life over which men ought to travel?

And let us never forget that we mutually impress each other by every action of our lives. If we violate a contract made with another, we produce a bad impression, and we injure not only the man but the community. That unfavorable impression is retained, and it may be a generous and confiding man has been rendered, for life, penurious and distrustful. But, if we keep our contract, we produce a good impression, which is quite as permanent,—the man has confidence in us, and we impel him to increased confidence in his species. He meets us with a bright smile because we have done well. If men only reflected thoroughly on the power of external circumstances and individual laws of organization, they would act with greater wisdom and justice toward each other.

Far be it from me to insinuate in these pages that man is ever carried to any line of conduct by physical impulse or necessity. If we suppose this, then man becomes a mere machine; and no longer responsible for his conduct, he is unworthy of either praise or blame. Virtue becomes a figment. Every action of his life is the result of choice, and that choice connects itself with a degree of moral responsibility proportioned to the extent of which he has a clear and adequate perception of his obligations. The very idea of virtue implies resistance to temptation, and an enlightened and willing fulfilment of duty.

A Difficult Question Answered.

"Can any reader of this paper," says an exchange, "tell why, when Eve was manufactured from one of Adam's ribs, a hired girl wasn't made at the same time to wait on her?"

FANNY FERN says in reply:

"We can answer the question easily! Because Adam never came whining to Eve with a ragged stocking to be darned, a collar string to be sewed on, or a glove to be mended, 'right away, quick now!" Because he never read the newspapers until the sun got down behind the palm trees, and then stretched himself, yawning out, 'Ain't supper most ready, my dear? Not he. He made the fire and hung over the teakettle himself, we'll venture, and pulled the radishes, and peeled the potatoes, and every thieg else that he'd ought to! He milked the cows, and fed the chickens, and looked after the pigs himself. He never brought home half a dozen friends to dinner, when Eve had'nt any thing for dinner, and the mango season was over! He never staid out until eleven o'clock to a 'ward meeting,' hurrahing for the out and-out-candidate, and then scolding because poor Eve was sitting up and crying inside the gate. To be sure he acted rather cowardly about the apple gathering, but then that don't depreciate his general usefulness about the garden! He never played billiards, nor drove fast horses, nor choked Eve with cigar smoke! He never loafed around corner groceries while solitary Eve was rocking little Cain's cradle at home. In short, he did'nt think she was especially created for the purpose of waiting on him, and wasn't under the impression that it disgraced a man to lighten his wife's care's a little.

"That's the reason that Eve did not need a hired girl, and we wish it was the reason that none of her fair descendants did!

Lemon Pies.—Beat, with the yolk of four eggs, two tablespoonsful of melted butter, four of white sugar, the juice and grated rind of two lemons. Put into a rich paste and bake. Then beat the whites to a froth, adding two tablespoonsful of grated sugar. Spread on the pies when done, put them in the oven and bake again for three minutes. The above is for two pies.

How to Clean Teeth.

There is, in my opinion, no dentrifice used so baneful in its effects as charcoal. I doubt if there is a dentist, with a fair practice of ten years, but has seen worse effects from its use than from the use of acids. I have had, in my own practice, to insert three sets of teeth where the gums were destroyed, and the teeth dropped out from the use of charcoal. In two of these cases, the gums were permanently discoloured, so that there can be no mistake of its agency.

The effect of charcoal is purely mechanical; it is as sharp as diamond dust, and the finer the worse its effects. Being perfectly insoluble in the fluids of the mouth, it insinuates itself between the neck of the tooth and the gum, producing ulceration, recission, and final loss of the tooth itself. Next to charcoal, in their bad effects upon the teeth, are the various kinds of boles and earths, under different and high-sounding names, and popular as tooth powders.

I would have my patients use no kind of powders upon their teeth oftener than two or three times a month; then I would not have them use the brush, but take some finely prepared chalk, and a stick of red cedar, orange, or hickory, (we should say, soft white pine,) about three inches long, wedge shape, and from one-eighth to one-quarter inch wide; with this polish the enamel, being careful not to irritate the gums.

The great dentrifice that should be used at all times, and under any circumstances, is soap. Its alkaline properties serve to neutralize the acid contained in the fluids of the mouth, and its cleansing properties will correct the breath, and remove offensive odor sooner than any article I have ever seen tried. I have seen the best effects from its use in tenderness and inflammation of the gums denoting acrid secretion, and have never known it to fail in its results.

Mason and Dixon's Line.

Repeated inquiries are made as to the origin and application of the term "Mason and Dixon's Line." The following is given as its history:

"On the 4th of August, 1763, Thomas and Richard Penn, and Lord Baltimore, being together in London, agreed with Charles Mason and Jeremiah Dixon, two mathematicians, to mark, run out, settle and fix the boundary line between Maryland on one hand, and Delaware and Pennsylvania on the other. Mason and Dixon landed in Philadelphia on the 15th of November following, and began their work at once. They adopted the peninsula lines, and the radius and tangent point of the circular of their predecessors. They next ascertained the northeast coast of Maryland, and proceeded to run the dividing parallel of latitude. They pursued this parallel a distance of twenty-three miles, eighteen chains, and twenty-one links, from the place of beginning at the northeast corner of Maryland to the bottom of a valley on the Dunkirk creek, where an Indian war-path crossed their rout, and here, on the 19th of November, 1767—ninety-three years ago—their Indian escort told them that it was the will of the Sioux nation that the surveys should cease, and they terminated accordingly, leaving thirty-six miles, six chains and fifty links as the exact distance remaining to be run west to the southwest angle of Pennsylvania, not far from the Board Tree Tunnel on the Baltimore and Ohio railroad. Dixon died at Durham, England, 1777; Mason died in Pennsylvania, 1787."

Grammar in Rhyme.

(1.) Three little words you often see,
Are Articles—*a*, *an*, and *the*.

(2.) A Noun 's the name of any thing,
As *school*, or *garden*, *hoop*, or *swing*.

(3.) Adjectives tell the kind of noun,
As *great*, *small*, *pretty*, *white*, or *brown*.

(4.) Instead of nouns the Pronouns stand—
Her head, *his* face, *your* arm, *my* hand.

(5.) Verbs tell of something to be done,
To *read*, *count*, *sing*, *laugh*, *jump*, or *run*.

(6.) How things are done the Adverbs tell,
As *slowly*, *quickly*, *ill*, or *well*.

(7.) Conjunctions join the words together,
As men *and* women, wind *or* weather.

(8.) The Preposition stands before
A noun, as *in* or *through* a door.

(9.) The Interjection shows surprise,
As, *oh!* how pretty; *ah!* how wise.

The whole are called nine parts of speech,
Which reading, writing, speaking teach.

From the New England Farmer.

Ashes against Plaster.

Many farmers will expend money freely for plaster, and consider it a profitable investment, but at the same time throw or give away their wood ashes! At least, such has been the case. This is poor economy. While we regard plaster as a valuable article, we, at the same time, rank wood ashes much higher in the scale of fertilizers. It is true that no very accurate experiments have as yet been made to ascertain precisely the specific value of plaster and ashes; yet every one who has applied them to his soil and growing crops must have seen enough to convince him that both are serviceable, and especially that ashes should always be collected and preserved with care. In the "*Buckeye Plowboy*," some years since, a writer apparently desirous of placing this subject in its proper light, but with somewhat less minuteness of detail than is perhaps requisite to the consummation of such an undertaking, details a single experiment instituted by himself as follows:

"I took three rows in a small piece of corn by the side of my garden, and put a handful of ashes on each hill of one row, a teaspoonful of plaster on each hill of another, and the third, left without putting on any of either. I cultivated them all alike, hoeing them twice. During the season some pigs got in and rooted up one end of the rows, leaving but about five rods of each that came to maturity. In the fall I husked the rows, as far as they had not been injured, and weighed the ears of each:

Weight of the ashed row,	49¾ lbs.
Weight of the plastered row,	48½ "
Weight of the row which was neither ashed nor plastered,	41¼ "

"The ground was green-sward, turned over in the spring, the soil clay, inclined to loam."

We present the following analysis of the ashes of the sapwood of white-oak, (*Quercus alba:*)

Potash,	13.41
Soda,	0.52
Sodium,	2.78
Chlorine,	4.24
Sulphuric acid,	0.12
Phosphate of Peroxide of Iron, Phosphate of Lime, Phosphate of Magnesia,	32.25
Carbonic acid,	8.95
Lime,	30.85
Silica,	0.21
Magnesia,	0.36
Soluble Silica,	0.80
Organic matter,	5.70
	100.19

Many analyses have been made of the corn crop, and the following, embracing the ashes of the kernel, leaves and cob, we give, in order better to enable the reader to understand *why* ashes applied to this vegetable, as a manure, must necessarily be productive of beneficial effects.

Analysis of the ash of the kernel of white fint corn, "grown on a sandy soil, and manured with *coal* ashes."

Silica,	9.500
Alkaline and earthy Phosphates,	35.500
Lime,	0.160
Magnesia,	2.410
Potash,	23.920
Soda,	22.590
Chlorine,	0.405
Sulphuric acid,	4.385
Organic matter,	0.367
	99.237

Analysis of the ashes of the leaves:

Silica,	53.550
Earthy Phosphates,	19.250
Lime,	6.092
Magnesia,	1.250
Potash,	12.762
Soda,	8.512
Chlorine,	9.762
Sulphuric acid,	4.185
	115.363

Analysis of the ashes of the cob:

Silica,	13.600
Earthy Phosphates,	23.924
Lime,	0.300
Magnesia,	0.900
Potash,	35.802
Soda,	5.914
Chlorine,	0.132
Sulphuric acid,	0.345
Organic matter,	2.314
Carbonic acid,	6.134
	89.365

The reader will not fail to observe how largely those elements prevail which are the

most important to nearly all plants, such as the earthy phosphates, the potash, soda, and silica, or sand. He will observe, too, that they are far from being insignificant even in the *coal ashes*. If this analysis is correct—and we have no reason to doubt it—coal ashes ought to be more generally preserved and used as a fertilizer.

The ashes of all wood are composed very nearly of the same materials, and so far as effects upon vegetation are concerned, it is of very little consequence whether they are from oak, elm, maple, or any other variety. Ashes from soft wood are said to be less valuable; but we have high authority that the ashes of the hardest oak and the softest pine vary but a trifle in the materials which compose them.

From the New England Farmer.

Agriculture.

MR. EDITOR:—In order to obviate some of the prejudices which, unfortunately, exist among farmers against *book knowledge*, I wish to say a few words upon *scientific*, *experimental*, and *practical* agriculture.

Scientific agriculture, as I understand it, explains the various methods of cultivating, improving and beautifying the earth, so as to render it more productive and delightful. The term *agriculture*, is derived from "ager," a field, and "cultura," culture, so that, according to its etymology, it means *field-culture*. In a restricted sense, it is confined to, and explains, the different operations required in the cultivation and improvement of arable and grass lands, and whatever appertains to the same; the cultivating and preserving different kinds of crops, fruits, &c. In a more extensive sense, it includes the breeding, rearing, feeding and management of all kinds of stock, and the disposal of the same. And it is the particular province of *scientific* agriculture to explain the reasons why things should be done thus and so, and not in a different manner. *Science* means knowledge; and he who possesses it, is master of his subject, and is competent to explain it. But, as it is human to err, and there is no such thing as human perfection, it frequently happens, that our most scientific men are mistaken in some points, and therefore are not perfectly reliable in all their statements; and the reason is obvious, either because they have been deficient in scientific knowledge, or because they have carelessly overlooked some of the causes which have contributed to produce a certain result, or have attributed the result to wrong causes. In either case, it does not prove the uselessness or the worthlessness of science, or book-knowledge, but directly the reverse; for, if the most knowing and scientific sometimes make mistakes, the least scientific, that is, the most ignorant, will be the most likely to make the most frequent mistakes. Errors of this kind are the result of ignorance, and not of science or knowledge; and their frequency is generally in proportion to the degrees of ignorance which prevail. Ignorant people, on this subject, are like narrow-necked bottles, the less they have in them the more noise they make in pouring it out. They seem to think that "a little knowledge is a dangerous thing," especially if it be derived from books. At least, they think it quite unnecessary for farmers to trouble themselves much about book-knowledge, or to try to educate themselves beyond their immediate labor in the field. They seem almost to entertain a prejudice against one who devotes much attention to subjects of art, or science, or general literature, as though such studies were inconsistent with the ordinary business of a thrifty farmer. Very few farmers are so burdened with work that they cannot find one or two hours each day for other studies besides those which relate to agriculture. The objects of all our private studies should be the better to qualify ourselves for our work, to make us more intelligent, more skilful, more scientific, and thus to raise ourselves above mere serfs and labourers, to a position of influence and growing usefulness.

Experimental agriculture differs in some respects from the scientific, inasmuch as it consists in endeavouring to find out, by a series of experiments, what science already knows and is prepared to teach systematically. All experiments are more or less expensive. It may cost hundreds and thousands of dollars to test and to make sure what we desire to know. To accomplish our purpose, time and money and labor are required. But, when we have once obtained our knowledge by well tried experiments, and printed the results in a book, it then ceases to be experimental, and is so much added to our present stock of scientific knowledge. Every one who tries experiments should be a man of thought and reflection, who knows how to combine elements, so as

to make wheat, corn, roots, and other vegetables grow, upon which man and beast subsist. He should be a reader of agricultural books and periodicals, a careful observer of nature, a close thinker, a correct reasoner, so as to be able to draw correct conclusions. In making experiments, he should do it at first on a small scale, and according to his means, and repeat them a sufficient number of times to establish their certainty. But, then, there would be less need of his making experiments, if he read more and understood better the experiments of others. Books should be "the man of his counsel and the lamp to his feet to guide him in the path of duty," because books contain the experiments and the experience of others. Still he should not believe in the truth of every statement which he finds in agricultural books and papers, especially in the latter, because many of the writers in the agricultural papers are uneducated men, honest and truthful, but they do not know the whole truth, and are liable to make wrong statements. For instance, in the use of salt, quicklime, potash, &c., for agricultural purposes, great caution is necessary, however strongly they may be recommended; because, when improperly used, or in wrong quantities, they are very destructive to vegetation. It is chiefly owing to the mistakes which have been made in the use of these and such like articles, that so many prejudices exist against book knowledge.

Practical agriculture is founded on science, experiment and experience; in other words, it is practical knowledge applied to farming, whether that knowledge be derived from books containing the result of other men's experience, or from our own thoughts, study and experience. At any rate, it is not visionary or theoretical, but practical. It consists in applying the well-known and well-established principles in the science of agriculture to the cultivation and improvement of the soil, in rendering it more productive and better fitted for the support and accommodation of man and beast. We have many practical farmers who do not pretend to be very scientific, or much given to experiment, but whose practice works to a charm. They read and think and judge for themselves, and apply in practice whatever appears to be right and reasonable. They are not only practical, but progressive farmers. They are continually learning more and more, and doing better every year. They go on from one degree of improvement to another, so that you may know them by their *good fruits*, as well as by their good works.

JOHN GOLDSBURY.

From the Country Gentleman and Cultivator.

Cooked and Uncooked Food for Swine, and how much Pork a Bushel of Corn will Make.

Several articles have appeared in the *Country Gentleman*, during the past year, on the above questions. These same questions were propounded years ago, and men then, as they do now, gave their opinions and the results of their experiments, and they differed widely then, and so they do now, and these questions are still open for discussion, and probably will so remain for a long time to come.

Ask any number of farmers which would fatten swine the fastest, cooked ruta bagas and a given amount of barley meal, or raw grated bagas and the same amount of meal, probably nine-tenths of them would say those fed on the cooked bagas would fatten the fastest.

A few years since the result of such an experiment was reported in the Irish Farmer's Gazette:

"Eight hogs were selected and divided into two lots as evenly as could be, and put up to fatten on the 27th of November. Each lot was fed regularly three times a day, having each 12 pounds of bran and barley meal, the only difference being that one lot had steamed ruta bagas, and the other pulped (grated) raw ruta bagas. The experiment was continued thirty-nine days; the lot having *cooked* food eat 468 pounds of bran, &c., and 10,920 pounds of ruta bagas, and increased 103 pounds, while the lot having *uncooked* food eat 468 pounds of bran, &c., and only 5,460 pounds of ruta bagas, and gained 110 pounds. It will be seen that the lot with cooked food eat twice as much ruta bagas as the lot having uncooked, and at the same time did not gain as much in weight by seven pounds."

The foregoing is certainly a very unlooked for result—an entire loss of 5,460 pounds of bagas, and the expense of cooking, and the less gain in weight of hogs by seven pounds.

Some may ask if there is a loss in cooking bagas and other roots, is it not better to cook the meal fed to swine. The late Mr. Col-

man, in his Fourth Report of the Agriculture of Massachusetts, gives the results of some of his experiments and conclusions drawn therefrom, and says:

"A peck of Indian meal, taking up as much water as it would contain, gave a kettle nearly full of pudding, when half a bushel of meal imperfectly prepared gave a little more. This seems to demonstrate the great advantage of cooked food, both as it respects its increase of bulk and the improvement of its nutritive properties."

Long continued cooking, and increase of bulk, he thought, added much to the nutritive qualities of the meal, and I presume most farmers are of the same opinion.

But Joseph How, Esq., of Methuen, Mass., arrives at a different conclusion from the above. In the Essex Co. Transactions, 1848, he gives the details of feeding five pigs from the 15th of August to the 28th of November, feeding alternately on cooked and uncooked food, changing the food several times during the trial, and weighing the pigs at each change of feed, and he says:

"That there should be no mistake in regard to the above experiments, I have fed them nearly all the time myself, and weighed them myself, and the result was in favor of *uncooked meal.*"

In Flint's Agriculture of Massachusetts, 1855, Albert Montague of Sunderland, gives the result of an experiment in feeding swine with cooked and uncooked food:

"The meal cooked and uncooked was alike, one-half corn, one-fourth oats, and one-fourth broom seed. I cooked the meal by stirring it into boiling water, and letting it boil from thirty to forty minutes, by which time it would swell to three times its capacity before boiling. The pigs selected were all doing well upon uncooked food. I put four in two pens, side by side, weighed them four different times; kept a correct account of their weight at each weighing, and weighed the same hour of the day each time. I fed two of them with cooked meal four weeks, and they were not so heavy by eleven pounds as at the time I commenced. They were weighed twice during the time. They eat four bushels of meal. I fed eight and one-fourth bushels of meal, uncooked, to the others, and they gained eighty-two pounds. I then fed the last named pigs three and one-half bushels of cooked meal, and in three weeks they lost four pounds. I fed five and a half bushels of raw meal to those first fed on cooked food, and in three weeks they gained sixty-one pounds. I think this proves conclusively that we cannot fatten swine with profit on cooked food. Had my pigs never had any meal but what had been cooked, I presume they might have improved a little upon it; but taking them from uncooked and putting them upon cooked food, they did not eat quite so freely at first as they otherwise might—hence a loss.

"But when we remember that even a hog cannot be so *hoggish* as to more than fill himself, and one quart of cooked meal would fill as much as three quarts of uncooked meal, we can easily see that a pig fed on uncooked meal would eat nearly three, or quite three, times the value of meal compared with the one fed on cooked food—providing cooking did not increase the value one-third, then a pig would not be able to eat enough to fatten readily, and it must take a certain amount of food to support life, whether cooked or uncooked. Taking swine from uncooked food, in both cases, they lost in weight, but, on the other hand, taking them from cooked food and giving them uncooked food, there was a fair gain."

A certain amount of food is required to keep up the warmth of the animal, and repair the daily waste going on in the system. A healthy ox, horse or hog, can be so fed as neither to gain or lose ten pounds in weight for weeks together. Or if the same animals are judiciously and full fed with nutritious food, they will largely gain, both in fat and muscle, because a portion of the food not needed for keeping up the temperature of the body, and repairing the daily waste of the system, will be assimilated and converted into "fat, bone and muscle." Now, if one quart of meal, by being cooked, assumes the bulk of three quarts of raw meal, it is possible that Mr. Montague's pigs could not eat a sufficient quantity of cooked to any more than keep up their weight, or not quite that, while being fed on the cooked food. But when fed upon the raw meal, in the same bulk, they obtained about three times the nutriment. How much of the uncooked meal was assimilated, of course no one can tell, but according to Mr. M's statement, enough to produce a "fair gain."

Some over two years ago there was published account of Mr. S. M. Clay's experi-

ments in feeding boiled corn, cooked meal, and dry shelled corn to swine.

The results of Mr. C.'s experiments, confirmed as they are by those of others, show that the grinding of corn into meal, and cooking the latter, will make one bushel of corn produce more pork, (live weight,) than two would do, and nearly as much as three would if fed whole and uncooked.

The results of Mr. Clay's experiments show that the number of pounds of pork for each bushel of corn was as follows:

When fed in the form of	boiled corn,	14½ lbs.
do.	do. cooked meal,	16½ lbs.
do.	do. dry corn,	5¾ lbs.

In the last vol. of Georgia Gentleman, A. S. Proctor, Ill., tells us "how much corn will make a pound of pork." His pig ate in sixty-one days, 5 5-9ths bushels of corn at 35 cents per bushel—$200, and it made 43 lbs. of dressed pork, worth 5½ cts. per pound, $2.36—or 36 cents more than the corn fed to him was worth in the crib.

If the statements of Mr. Clay are correct, Mr. Proctor actually lost about two-thirds of the corn fed to the pig, which might have been saved if the corn had been ground into meal and cooked before having been fed. As Mr. P. is good in figures, we hope another year he will experiment on two or more pigs, feeding one lot on raw corn, the other on cooked meal, and cypher out the results and have them published in the Georgia Gentleman.

Mr. Proctor realized 41 cents per bushel for his corn—by way of set off I will show how much a New Hampshire farmer obtained per bushel for his corn, fed to a pair of pigs. In the Georgia Gentleman of 23d April, 1857, W. A. Harriman of Warner, N. H., gives the result of his experience in "fattening pigs." He says:

"Last spring I bought two pigs four weeks old the 19th of May, for $6. They were taken home and fed on sour milk for two or three weeks, giving them no more than they could eat from one feeding to the next, always sweeping out the trough at every feeding. In this way they will eat a little at a time, and as often as it is desired. At the end of two or three weeks I commenced stirring a little meal without heating, increasing the quantity as long as the trough was found clean at the next feeding. All the sour milk they had was what remained of the milk of two cows after a family of six persons had had their supply. Late in the fall I used more than half cold water to mix their meal in. Together with the sour milk, they ate five or six bushels of small potatoes, and twenty-eight bushels of corn meal. They were slaughtered when seven and a half months old, and weighed 660 pounds. Thus you see, that for every bushel of corn I received twenty-three and four-sevenths pounds of pork. The smaller pig was sold for ten cents per pound, which would make both amount to $66. Deduct six dollars which was paid for the pigs, and four dollars for small potatoes and sour milk, and you have $56 left, or $2 for every bushel of corn, not counting my labor anything."

The above statements of Mr. Harriman are perfectly reliable, and there are many others here whose "luck" in raising pigs is very similar.

Again in the Georgia Gentleman of 19th inst., you give the statement of Joseph Greene of Macedon, N. Y. He was very successful "in feeding pigs on *undiluted* skim-milk—or in its most concentrated state—without any water thrown in." If a pig can eat three gallons of milk each day, would it add anything extra to the growth of the pig if the milk was diluted one-half with water—in that case he would only eat six quarts of milk per diem. Hogs can't be fattened on water; yet some farmers act as though they thought there were great fattening virtues in water. They mash up their boiled potatoes, add a little meal, and water enough to make the whole mess about the consistency of egg-nogg; but this kind of swill is better calculated to make pot-bellied pigs, than it is fat porkers. One of my neighbors, who usually keeps four old hogs, says his swine are better judges of how much liquid or drink they need, than he is; so he has two troughs in the pen, one for milk, whey or water, and the other for dry meal. Instinct, or the cravings of nature, direct how much and how often to eat and drink. This man raises heavy, solid and well fattened hogs.

In turning back to the Georgia Gentleman of 10th of last November, I find an amusing article, in the Sam Slick style of telling a story, about fattening hogs on "parched corn and honey." This farmer who fattened his hogs on parched corn and honey, sometimes made them, when dressed for market, weigh over 700 pounds. He says:

"The best and cheapest kind of food I have found, when it comes time to put on the fat, is *parched corn*. I generally manage to buy a barrel or two of southern honey, if it is cheap enough, as it is sometimes. When it is not over four cents a pound, and pork is six, it pays first rate, and sometimes you can get it for two; it costs me about three cents on an average, or it won't do to risk it. About a half a pound of honey a day is enough; it must not cloy their stomachs, but little of it with their corn meal, will make the critter gain more extra than the weight of the feed.

"When parching is done in a proper way and upon a large scale, it is a cheap way of cooking corn, and is the most economical way of preparing it, as many experiments testify. The more slowly the corn is parched, the better. It is not necessary to have it "pop." Perhaps the word *roasted* would be better; but in this case it is to be understood that the corn is not to be blackened, burnt, or even browned but slightly. The application of moderate heat for some time has the effect to change a part of the starch into a sweetish substance called dextrine, which is more easily digested into fat than starch; that is, part of the making of fat is accomplished by the agency of heat."

The above may all be correct; at any rate I think I will try it, for large quantities of parched or browned corn can be had here much cheaper, "pound for pound," than unparched. There is an enterprising young man here engaged in making popped corn into corn balls—manufacturing about 400 barrels each winter. Much of the corn does not *pop;* this is sifted out, which he sells for one and a half cents per pound, while good yellow corn here now is worth two cents a pound. In popping 100 pounds of corn there is probably ten or more pounds of water driven off. The unpopped is easily ground, and molasses is cheaper than honey, and probably just as good for fattening the critters. For some weeks past I have been feeding my hens on popped corn meal; they are plump, glossy, and lay well. The corn used for popping is mostly a small, oily, flinty variety, and probably contains a larger percentage of oil than our common field varieties. If so, then it contains greater fattening qualities.

LEVI BARTLETT.

Warner, N. H.

For the Southern Planter.

On Snoring.

MR. EDITOR:

Sir—It may be asked, "why publish an article on *snoring*, in an agricultural paper?" I answer, "because everything rural belongs, in a certain sense, to your department." We certainly have snorers in the country, aye, and some very sturdy ones, who, even while asleep, make no little noise in the world, greatly to the annoyance of many, who would gladly be asleep themselves. Now these people, whether they like it or not, will be apt to learn from some of your numerous readers—I most cordially wish, for their own sakes, as well as yours, that they were, by thousands, more numerous—that they are attracting attention, or they may read the same with their own eyes.

"Hear, land o'cakes, and brither Scots,
Frae Maidenkirk to Johnny Groat's;
If there's a hole in a' your coats,
I rede you tent it:
A chield's amang you, taking notes,
And, faith, he'll prent it."

Some may think that such remarks might suit the secular page of a religious newspaper. Very possibly, as well as some pieces which I find on such pages. But I have fears that a large portion of the few who take such papers, beside the clergy, never read them. Verily, I feel much reluctance to believe that the clergymen are guilty of snoring. I had almost said of the *vice* of snoring! But I cannot, with certainty, pronounce it a vice. I have never heard it so pronounced from the pulpit. Yet I have never heard a clergyman snore, as much as I have associated with, and venerated them. A friend of mine, somewhat given to waggery, has told the following anecdote, which, although I have seen it in print,—I believe, in "The Virginia Literary Magazine," a work like your own, having, by thousands, fewer readers than it deserves,—I will here repeat it, believing it possible that not a single real snorer has yet read it. Let me premise, though, that gentlemen inclined to waggery are so keenly in pursuit of the fun and the moral, that they think little enough of the verity of facts. At least, for the latter, I stand not sponsor. But to our tale. A party of six or eight preachers, wending their way to a church judicatory, were benighted at a country tavern, already so crowded with guests that they all had to be

inclosed in the same room, with one bed, and such pallets as, in the emergency, could be provided. The bed was courteously yielded to an elderly and somewhat corpulent D.D. Beside the bed of this venerable gentleman, the best couch was appropriated to a man of high order of talent, who had been rendered a little irritable by sickness. He, overcome by ill-health and fatigue, implored his compeers to enter into a solemn compact that not a word should be uttered after the light should be extinguished. While the rest were trying to palliate the harshness of their pallets, by adjusting projecting bones to the scarcity of their protection from the floor, the noble old Dr., on his feather bed, softly fell into the arms of Morpheus. Soon the lower maxillary relaxed a little, with a consequent sudden snort. The sickly gentleman heaved a woebegone sigh at the reflection, that though he had stopped the mouths of "the wide-awakes," he had no means of closing that of his unconscious neighbor; meanwhile, the tittering listeners could scarcely restrain out-bursting laughter. And now

"The mirth and fun grew fast and furious."

The lower jaw fell to a death-like yawning, the veil of the palate fluttered as a leather-winged bat in the mouth and throat, the pendulum palati—as, I think, the doctors call it, flapped about, in the mouth, down the throat, up in the nostrils—for, in the case of snorers, I believe, it is generally elongated—'till finally it lodged fast in the rima glottidis, or top of the wind-pipe; after an awful yell—the whole house shaking all the time as if by an earthquake—in an instant all was still and breathless; for a period, painfully long, this death-like stillness lasted. Finally, the sickly gentleman, irritated to the last extreme, is said to have broken his own compact by an exclamatory whisper, "thank God, he is dead at last." A Yankee would guess, there was little sleeping there that night.

Whether we place snoring in the category of crime, of bad habit or natural defect—and, alas! in my intercourse with mankind, I have found that the majority would about as soon acknowledge the first as either of the other two—I have never seen the man who would confess himself to be a fully finished, unmitigated snorer. Many will admit that they would be such were they not wakened by the very first snort. I have often been kept awake, nearly all night, by those who would most provokingly asseverate the next morning, that their snoring, to the full extent, amounted only to this, "Why, Sir, to this extent, I know myself to be a snorer, for I have often snorted myself awake." And, to tell the whole truth, I must confess, and that upon the evidence of my wife,—and, Mr. Editor, I would rather cry "guilty" to either of the foregoing categories, which she might charge upon me, *in my sleep*, than contradict her,—I say, I must confess that I should soon have become "a pretty considerable" snorer, had I not been alarmed and resolved that this should not be.

The mention of the word *wife*, presents snoring in a new aspect—indeed, to my mind, it ranks it under the head of crime, where, by reasoning, I could not before place it. How many lovely, delicate, self-sacrificing wives have had the flesh snored off their bones by fat, jolly, self-indulgent husbands, who, if they acknowledge the charge at all, would laugh and say, they had been taken "for better and for worse," snoring and all. This, Sir, would as well excuse the brutal drunkard, who breaks the heart of his wife, and ruins his children, for whiskey.

Casuists have puzzled themselves, and their readers, by trying to settle the question, whether there be more sin committed in forming a bad habit, or continuing it—in yielding, painfully, to a transgression, or submitting tamely to be the slave of any vice. The profane man, who, probably, shuddered at his early curses, soon learns to belch them out with serene complacency. It, however, can profit him but little, to fix the period of his greatest iniquity, who still remains its slave. Repentance, without reformation, but adds stings to a life already miserable enough. Where cessation from wrong-doing—immediate and irrevocable—or the risk of ruin to the votary of vice, and great distress to all whose destinies are intertwined with his, are the only alternatives, there is but one wise, one safe course for him. Who can convince him of the awfully critical dilemma in which he stands? I would, by no means, place the snorer exactly there. But he must reform, or be the dread and annoyance of all who lodge with him abroad, and, I had almost said, a curse to his family at home. This is his dilemma. Verily, I fear that Pantheology is not yet banished from Christendom, and that there

are more idolaters, beside the covetous. Sleep, not balmy sleep given to be "tired nature's sweet restorer," but lazy sleep, morbid sleep, is the snorer's god. He can sleep all the better and snore the louder, after arriving at the perfection of his art, while you are shaking him. We might all be worshippers of this same morbid sleep were we, nervously, so constituted as to be subject to his chloroform influences. Like a still more wiley demon, he defeats his own powers by attempting to bring them over us so rapidly as to startle us.

But why inflict so long a desertation upon snoring, that few will begin and fewer will finish it? My dear objector! If to write on snoring had been my only aim, I should have made a short matter of it. There were correlative things which I wished to strike at; besides, if you had suffered half what I have from snorers, I think you would have found it hard to suppress all spite, and all desire to save others from similar durance. But let me tell my story in my own way, and it will come to a close at some time.

Having made a great fuss about snoring, which I find to be the only way of gaining attention from the go-aheads of these times, I should now attempt to tell what it is, and promise directions for its cure. To do this more correctly, I confess I have consulted medical books a little. By the jaw-cracking terms used, I fear I have only increased confusion in describing the parts concerned in the operation. I hope, however, I have quoted them correctly. As to snoring itself, I can find nothing, except that it is "a sound supposed to be made between the nostrils and the palate, by persons in sleep." Of the cure, the learned doctors say nothing, I suppose wisely, because they know nothing. Snoring, then, is a sound, and a horridly ugly one, produced by a relaxation and mal-position of some of the organs of respiration. The muscles of the lower jaw relax when the patient falls asleep, and if its position be dependent, and no extraneous support afforded, it falls by its own gravity, the mouth, of course, opens, the root of the tongue yields, giving passage to the breath through the mouth, and making room for all the flapping of the velum, and flirting about, like a piece of whip-cord, of the pendulum palati, described already, whilst the nose is occasionally opened, like the valves in the chimneys of a steam engine, to add horror to the frightful belching. We may fret, or laugh at it, as the humor leads us, but the poor patient suffers enough, I should think, to make him try the very simple remedy which I am about to recommend.

It is this—Keep your mouth shut, when you sleep, if you have to tie it up, and this will save you from a painful, crust-like dryness of all its parts, and that awful approach to suffocation which you so often experience. I might stop giving directions for the cure just here, leaving to individual ingenuity, in each case, to adapt the mouth-closer to the shape of the head under operation. It should be remembered, however, that the chin and lips have many glands, which it is not safe to irritate by bandages too tight or too rough. I would further suggest, that a cap to fit the chin, made of netting or soft cloth, and attached to the night-cap by elastic strings, (or common tape might do,) just back of the eyes, so as to pull upward and not backward, with attachments, which might also be necessary, behind the ears, might form an apparatus which would answer the purpose. In my own case, at home, I use a very soft and long little pillow. After shaking the feathers to one end of the pillow, and adjusting the level of the chin to that of the crown, to neutralize the weight of the jaw, I place the pillow, with its empty end uppermost, upon the common pillow and at right angles to it, causing the stuffed end to rest on the arm next the bed, in the upper part of this latter I ensconce the chin and go to sleep, fearless of opening the mouth, and, of course, fearless of snoring to hurt anybody. When abroad, I tuck some part of the covering—the sheet, generally,—under the shoulder next the bed, draw it over the shoulder uppermost, then secure it on the pillow under the temple, rest the chin upon it, and feel equally safe. This treatment has cured my case. Something more stringent might be required for the inveterate and long-continued. Diseases and vices strengthen much by habit.

Had this article been published in a medical journal, none but the doctors would have seen it, and I had no idea of indoctrinating them in the sublime mysteries of snoring, when nobody afflicted with it would send for them to cure it. No one hates quackery more than I do, but where diseases can be safely trusted to domestic treatment, I have no objection. The doctors are, many of them, fine fellows—but still they are necessary evils. When necessary,

by all means, send for them. We can cure snoring, when asleep, as we cure folly when awake—by keeping the mouth shut.

It may be thought that I owe an apology to the clergy, for the freedom with which I have treated them in the foregoing anecdote. I know there could not have been accuracy of detail, but, like most anecdotes, it was built of materials mainly furnished gratis by the architect. No man can revere the body of our Virginian clergy more than I do. No man can dread their snoring more. They travel about so much, and there is a general prejudice against snorers, that I thought the anecdote might do good. As for the few who ought to have their mouths stopped in the day-time, they may snore as much as they please at night, if they will keep out of my hearing. I ought to have said, never lie on your back, snorer. Tyros may soon learn the art by assuming this position. Yours, C.

For the Southern Planter.

Grasses.

Remarks on the Peculiar Difficulty of Rearing Grass on the Atlantic slope of Virginia and other Southern States—Utility of the Effort Discussed—Its general Relinquishment Premature.

MR. EDITOR:

Sir—The subject chosen for the following article has been so long neglected in this region, that I fear not one of your numerous readers will feel disposed to offer the slightest thanks to the writer for its publication. The idea of hay-making, to any extent, is, I fear, considered among the oldest of *fogie* notions. Descended chiefly from the dwellers in the British isles, where, from the moisture of the climate, grass grows so luxuriantly, and stock-raising so favorite an employment, our fore-fathers very naturally wished to make the same business an object of their attention. I can well remember that almost every land-holder had his meadow, little or big, nearly three score and ten years ago. The grass chiefly employed was timothy. The late Hon. A. B. Venable, Sr., introduced on his own farm, in Prince Edward, the red top or herds' grass, and this soon superseded the timothy, being better adapted to all moist grey lands, and more disposed to scuffle for itself, as a volunteer, where not destroyed by the plough. This propensity has caused its spontaneous propagation, in moist lands, for many miles around its original locality in this region.

The peculiar position of the region in question, with mountains on the north and west, and an ocean on the east, renders our climate liable to sudden attacks of intensely cold weather in winter, which destroy young grass sown in autumn, and our liability to long-continued and scorching droughts in summer expose that sown in spring to equal danger. So that from these two causes have sprung much difficulty and discouragement in the cultivation of grasses, in the country designated.

There is another difficulty arising from the negation of lime and its compounds, in sufficient abundance to promote a free growth of grass on our soils. In much of our mountain country, further south than we are, e. g., in Roanoke, Pulaski, Wythe, etc., where the grass grows with amazing luxuriance, and the cattle grow to equal any in the world, we find as bitter cold in winter, and as burning drought in summer, as we have here. We are left to infer, that there must be there some grass-fertilizing elements in the soil denied to ours.

With these difficulties constantly before our people, there is no cause of wonder that so many of them should have come to the conclusion that this is no grass country, and have given up the effort to raise it in despair. Some gentlemen, who owned good lands, succeeded most handsomely in raising clover, and this tempted the owners of poor land, which could never have brought clover, had it never been too hot or too cold, too wet or too dry, to throw away an incalculable amount on clover seed. This premature and unsuccessful application of clover seed to exhausted land has greatly confirmed the influence of the adage, that "this is no grass country," and deprived us generally of the benefit of clover, the king of grasses, for many years to come.

We might have learned something of the art of grass-raising from the very few foreign farmers who have settled amongst us. Mutual prejudice, after the revolutionary war, probably kept away English farmers. I have never known one in the whole land. There was, formerly, a very small sprinkling of German, Scotch and Irish farmers in our interior counties, who were distinguished for their fine meadows. These worthy citizens are hardly to be found now. The

cheapness of rich lands in other portions of our Union, or mayhap misrepresentations of our slave labor keep them away. The immigration of many of such as I have known is desirable.

It is certainly wise to be governed by maxims which are really true. We are always liable to error when we give credence to such as are not well founded. That this, in its present condition, is not a good grass country, may safely be admitted. But we might fall into error, and suffer much injury, if we determine never to aim at the culture of grass at all. It requires but little inquiry into the workings of nature to learn that she is continually providing for the nutriment of new vegetation from the decay of the old. And we must either trust to her slow process of renovating exhausted soils, by means of poverty grass, running briers, broom straw, and old field pines, for the restoration of fertility to our lands, or we must, by ploughing in what are called green crops, bring about the same result much sooner. And we must do this, not because we expect to make this a fine grass country, but because it is the cheapest and most speedy way of making it a fine agricultural country, and, perhaps the only way. We are not compelled to pursue plans recommended by others in the prosecution of this object. The culture of grass has been but little attempted in this country, and is comparatively new. It is highly probable that new plans of operation, and different from those adopted in Europe, might suit our peculiar condition better. The writer having failed so often, when sowing grass-seed in spring and autumn, has, for many years, chosen to sow in summer. He has preferred the last week in August, or a little sooner, if the weeds in his stubble-fields were advancing rapidly. He has never yet failed, when sowing at this time on wheat or oat stubble, after running seven-toothed harrows once or twice over the ground, or dragging it with a twenty-toothed rake. This year he has simply sown the seed without using any implement of culture, the rag-weeds having grown too thick and high since the rainy season commenced in August, (the 13th,) for the use of the rake or harrow. He expects to succeed, as he never believed that the slight cultivation of rake or harrow could do much good on hard stubble land. The clover and grass thus sown have uniformly come to maturity in due time the next year. The seed are sprouted and the young plants rapidly advanced by the fall rains; and having no plants of small grain to contend with, and being protected by the dead weeds, are almost certain to withstand the winter.

Another idea is thought worthy of consideration. Heretofore but a small variety of grasses has been brought into cultivation amongst us. Perhaps, by increasing the number, we might find some kind which would suit our soil and climate better than any before tried. The writer, however, has failed egregiously in an attempt of this sort. He has recently been experimenting some which promise better things. He thinks the Orchard grass, the Randal grass, the mountain evergreen, will all do well if properly nursed. He purchased, at a high figure, a bushel of what was sent to him for Italian rye grass, which, when pure, is an annual; but, as it proved to be perennial, he supposes it to be English rye grass—which failed, in his hands, many years ago. Be it what it may, it will not do here. From very small experience, he is greatly pleased with the English fox-tail grass. On moist sandy land it will certainly do well. He has now, under experiment, several varieties of Virginia wild rye grass, which he thinks may become valuable. It springs early, and grows late in the fall, and flourishes on soil of moderate fertility. Its seed-stalks arise from two to more than six feet in height. As an indigenous grass, it is worthy of attention. It seems to be relished by stock, and grows as well, seemingly, in dry seasons as in wet. I greatly prefer it to the far-famed Rescue grass. It might prove beneficial, if any gentleman would thus experiment on small patches of grass, and if the seedsmen would, at moderate prices, supply small parcels of seed.

But it may be asked, why seek for less valuable grasses when we have clover, the king of grasses, which we may cultivate successfully, if we take pains enough? The plain answer is, because we may thus more certainly rear clover, and derive greater benefits from it. With a good field of any forward grass, on which to sustain our stock, in early spring, until our clover attains its full growth, we may not only derive an hundred fold benefit from the clover, but may save it from total destruction. Mr. W. Gilmer, of Albemarle, at a meeting of the Agricultural Society, some years ago, in

Richmond, gave us instructions on this subject which ought never to be forgotten. He fully demonstrated that by suffering the buds of the clover, in its infant state, to be nibbled out by stock, we suffered injury as incalculable as are the benefits derived to the clover, the land and the stock, by preserving it from depredation until it arrives at full maturity. But to spare the goose laying golden eggs is a lesson hard to learn.

It may be an auspicious time to press the claims of grass-culture on the attention of farmers, when their favor is so strongly turned towards chemical manures. We cannot alter the difficulties connected with our climate; we cannot cause rain when we please, nor temper the bitterness of the cold to the young plants, but we may, in a great degree, change the constitution of our soils by adding to them such chemical agents as so wonderfully qualify them for the production of grass. In doing this, while we by no means expect to rival the mountain grass lands, we should make some approach toward their excellence, and then we should make great improvement in the production of the peculiar objects of our agriculture—tobacco, corn, and small grain. We have already declared that we have no more cold in winter nor drought in summer than that suffered in some of our south-western counties. Indeed, our frosts cease earlier in spring and come later in fall. We must then ascribe our great inferiority to that region in the growth of grass to defects in our soil, rather than in our climate. We should endeavor to approximate the excellence to which we cannot attain, and if there be truth in human effort, we must, to some extent, succeed. In difficult enterprises, those who never try, always fail. There can be no doubt but that the bulk of our people have labored under great deception with regard to grass-culture. The majority, perhaps erring from want of reflection, practically neglecting what they did not choose to take the trouble of investigating. But there were some who, on principle, opposed it, denying both its practicability and usefulness. I have, within the last ten years, heard an educated agriculturist declare that he had too much trouble killing grass to be sowing its seed, and that his doctrine was to get every dollar he could out of his land, and never to return one to it. On this plan golden eggs would soon cease to be laid.

The writer would not have it understood that he considers that this could be made a fine grass and stock country by any compensating course of treatment. He only means, that by judicious efforts to clothe every field at the proper time, in the rotation, with a coat of good grasses, we might soon fertilize the whole area of cultivation, bring all to good clover heart, and realize far higher profits than we do on the present prevailing system. He firmly believes that it was intended that different realms should be adapted to different objects of culture, but that we may intermingle matters not naturally and specially calling for our attention, with those peculiarly our own, where it can be done beneficially. It is very true that much may be done by turning under rank weeds, oats and rye, (the two latter both grasses,) but not so much, the writer thinks, as by sowing grasses regularly for this purpose and for the sustenance of animals. Peas—which below tide-water work so well as fertilizers—interfere too much with the tobacco crop in this region. Clover—which though no grass at all, the writer has styled king of grasses—may be thus used, but to much greater advantage with the aid of other grasses.

Most truly and respectfully yours,

C.

Cumberland, September. 1860.

Agriculture in France.

"Regarding agriculture, it must be made to participate in the benefits of banking institutions, to clear away forests situated in plains, to replant the mountains with trees, to lay out every year a considerable sum on great works of draining, irrigation and tillage. These works, by transforming waste lands into cultivated grounds, will enrich the communes without impoverishing the State, which will get back its advances by the sale of a part of those lands restored to agriculture."

Such is the programme of agricultural enterprise by which Napoleon proposes to elevate the half-starved peasantry of France. Surely, there is need enough that the Emperor should bestow a thought upon that hitherto ill-cared for portion of his subjects. The degraded condition of the French peasantry is a standing reproach to the government of that country. There are millions of people, of a stalwart and vigorous race, and living upon a tract of the finest soil in

Europe, who yet have been so neglected by their glory-seeking rulers, that they have become a mass of non-productive and non-consumptive paupers. France is not to be estimated by the wealth and luxury of Paris, nor by the numbers and the boasted bravery of her soldiery. These imposing aspects of French society naturally strike us most forcibly; but the truth is that they but cover, with a splendid disguise, an amount of poverty and of abject degradation of which the general world has no conception. France has her millionaires luxuriating in their palaces; but she has, also, according to the testimony of her own economists, a million of wretched cottages containing but one window, and fifteen millions of people living within a hair's breadth of pauperism. This immense proportion of the population of the country, instead of being the foundation of great national industries, is a dead, inert mass, retarding in every sense the progress of the country. The Emperor has had the sagacity to discover this plague spot in French society, and he has the policy to attempt its remedy. The cure he purposes applying is specified in the extract from his late speech before his Legislators quoted above. These splendid utterances may do very well as a specimen of fine speechifying; but, tested by their practical merit, they will be found wanting in the quality of economic prudence. They savor much more of the elation of one who is planning a piece of gardening for the adornment of his estate,—than of the weighty sentiments of a statesman who feels himself charged with the difficult task of elevating many millions of people from a compacted and spiritless degradation into which they have been settling through a long series of years.

We apprehend that this splendid scheme will be found to be too much in advance of the condition of the people for whose benefit it is more especially designed. The advantages offered through banking institutions and great public works of agriculture, to be useful must be put into the hands of those who know how to appreciate them and to turn them to practical account. The aids proffered can be of no permanent service to a class of people destitute alike of intelligence and enterprise. The French government will certainly find that the capital it loans out to its indolent and abject peasantry, instead of developing the untilled lands, will be wasted through the incompetence of those who receive it. The fact is, that the government has so completely ennervated this class of the population by the suppression of the freedom of the press, and, much more, by its system of conscription, which withdraws from active pursuits the flower of the country's strength and enterprise—that it has thrown upon its hands a mass of people utterly useless as to the purposes of national wealth, and incapable of any immediate improvement. The millions of the poorer peasantry serve no public purpose beyond that of an army reserve. If the Emperor desires to elevate his fifteen millions of paupers, let him not think of turning them into prosperous farmers by loaning them capital; but rather let him send the schoolmaster and the newspaper into their midst, allowing both agents to be the representatives of a vigorous freedom; and let him cease to take from their families those stalwart sons who are their chief hope. As to the scheme of transplanting the forests from the plains where Nature has placed them, to the tops of the mountains, it is a piece of splendid moonshine. It may be well enough as a dream of visionary theorists, who imagine that it would be the means of enticing the clouds to be more propitious; but as an actual project contemplated by the government of the country, it is a monstrous utopia. If there were a scarcity of land capable of cultivation, and the country were absolutely driven to it by a necessity so urgent as to make it imperative to try even such an unpromising experiment—then there might be some apology for the scheme. But the reverse is the fact. There are now five millions of acres of communal lands in France waiting for cultivation; why not operate upon this instead of experimenting upon the transplantation of forests?

There are those who are taking fright lest this attempt at the development of French agriculture should seriously interfere with the demand for American breadstuffs, by supplying the markets of Europe at rates cheaper than those at which we can afford to produce. There must, however, be more common sense and practicability about the efforts of the Emperor's government before any results can be forthcoming, likely at all to affect any existing sources of supply. We predict for this splendid scheme, a splendid failure.—*U. S. Economist.*

The Southern Planter.

RICHMOND, VIRGINIA.

Can Cows hold back their Milk?

In the May number of the *Farmer*, page 146, I see an extract from Dr. Dadd's communication in the *Stock Journal*, stating that cows cannot hold back their milk. This is contrary to the traditions of our fathers. I do not wish to dispute the authority, for it seems to me good; yet I do not feel quite disposed to discard my early teachings without a little more light on the subject. Will Dr. Dadd, or some one, inform me how we shall account for the fact that a cow, used to being *slopped* while milking, will, many times, refuse to yield her milk until she gets her *mess?* Why a cow with a young calf often refuses her milk until the calf gets hold of one of the teats?—in short, why does a calf "*bunt?*" These things are actual occurrences known to every farmer; and most of us have accounted for them, believing that some cows acquire the control over the milk, to hold it back at pleasure.

E. F. BARROWS.

Sheboygan Falls, Wis.

Every Dairy-man knows that a cow *can hold back her milk* at pleasure. Certainly she has the power for a limited time, until the udder becomes so distended as to be painful to her. A neighbor of ours has a cow, that, while in full flow of milk, will scarcely "give down" any, for two days after her calf is separated from her. We have ourselves, a cow that we have often seen prove the truth of the assertion. In that best of all works on dairy management, *Flint's Milch Cows and Dairy Farming*," the idea is by no means contradicted, and if it be untrue, why is it that a cow will fall off in her milk when she is removed to a strange stable and her food not at all changed; or when she is milked by a person to whom she is unaccustomed?—EDITOR.

For an anatomical description of the Cow's Udder, see Flint's Book, pages 145–6.

Gravel in Horses—Retention of Urine.

A friend has handed us a receipt which he says he has often tried for the relief of Gravel in horses, with so much success, that he believes it to be *almost infallible*. Here it is, "dissolve a lump of alum, about the size of a hulled walnut, in a quart of warm water. Turn the horse's head up as high as will enable you to pour the drench *into his nostril* without difficulty. Repeat the dose every half hour until he is relieved."

By the way, it is much the best way to drench a horse that we are acquainted with, (when the drench does not contain anything of a very highly stimulating or corrosive character,) to pour the dose through the nostril. When this is done, the liquid passes without any difficulty down to the stomach; whereas, if you drench in the usual manner, you run the risk of having the bottle broken in the horse's mouth, an accident which may prove of a serious nature—or, the horse may have a portion of the drench to "pass the wrong way" and get into his windpipe, producing strangulation, spasm of the throat, or suffocation.

The symptoms of Gravel are frequent ineffectual efforts to urinate, accompanied with pain of a more or less violent character. The horse will roll frequently, and look around towards the flanks, just as he attempts to lie down There will be no swelling about the belly, as is generally the case in an attack of Cholic, and the pains are remittant or periodic.

We have no doubt that many horses suffer greatly with these symptoms who do not have Gravel in the bladder; but only an irritation near the neck of the bladder, produced by a want of due care and attention to proper cleaning and greasing the "sheath."

The loose spongy black matter which gathers in the sheath when it is not kept scrupulously clean, absorbs urine, and becomes only partially dissolved—retaining its tenacity, it is not passed off, but forms a circle around the base of the penis, resembling in appearance and consistency, common tar. The skin below this matter becomes raw and very sensitive, so that the horse will suffer a good deal of pain whenever he attempts to "pass his water." The existence of this state of things can only be ascertained by a careful examination with the hand, which should be well greased before it is inserted into the sheath. The soft, irritating matter, should be removed as far as is practicable, with the fingers, and the sheath thoroughly swabbed out with warm water until it is clean. Some cooling lotion of an astringent character, should then be used several times a day until the horse is cured.

Decoction of Red Oak Bark, or a solution of Sugar of Lead, are both excellent applications.

Sales of Fine Stock.

We are informed that Gen. J. S. Goe, of Brownsburg, Pennsylvania, has sold to Col. Richard Peters, of Atlanta, Georgia, one fine brood mare by Bush Messenger, with foal by Climax, another with foal by Messenger, also six other mares served by Bush Messenger, and eighty Spanish Merino Ewes.

We but recently published the opinion of a highly respectable committee of the vicinage, in attestation of the superiority of Gen. G.'s cattle, sheep and horses, which superiority is strongly corroborated by the fact that Col. Peters has been induced to purchase so freely of him. Mr. Ellis J. Faison, of Duplen county, N. C., has also bought of the General a fine Messenger and Morgan entire colt. Success attend these enterprising purchasers and all stock raisers of character and integrity.

Mr. Guest's Nursery.

We have received from Mr. James Guest, (who has a large nursery of *choice fruit trees of every variety*, near the Second Toll Gate on the "Westham road" above this city,) his Catalogue of Trees, now ready for delivery to his customers.

Along with the list of names of his trees, he sent us some delightful *Pears*, the product of his dwarf trees. The Pears were of fine size and appearance, and of most delicious flavor.

Fleming & Nelson's Nursery of choice Fruit Trees and Ornamental Shurbbery, *near Augusta, Ga.* Catalogue received.

Carew Sanders & Co., of "The St. Louis Nursery," St. Louis, Mo., have sent us their Catalogue of Trees, Fruits and Shurbs,—which we find admirably gotten up—containing directions for planting, pruning, &c. Mr. Sanders is well known to the agricultural reading public, as a frequent contributor to various journals on horticultural topics.

Avarice and ambition are the two elements that enter into the composition of all crimes. Ambition is boundless, and avarice is insatiable.

When men's thoughts are taken up with avarice and ambition, they cannot look upon any thing as great or valuable, which does not bring with it an extraordinary power or interest to the person who is concerned in it.—*Anon.*

From Plain Talk to Farmers.

Portrait of an Anti-Book-Farmer.

Whenever our anti-book-farmers can show us better crops at a less expense, better flocks, and better farms, and better owners on them, than book-farmers can, we shall become converts to their doctrines. But, as yet, we cannot see how *intelligence* in a farmer should injure his crops. Nor what difference it makes whether a farmer gets his ideas from a sheet of paper, or from a neighbour's mouth, or from his own experience, so that he only gets good, practical sound ideas. A farmer never objects to receive *political* information from newspapers; he is quite willing to learn the state of markets from newspapers, and as willing to gain religious notions from reading, and historical knowledge, and all sorts of information except that which relates to his business. He will go over and hear a neighbour tell how he prepares his wheatlands, how he selects and puts in his seed, how he deals with his grounds in spring, in harvest and after harvest-time; but if that neighbour should write it all down carefully and put it into paper, it's all poison! it's *book-farming!*

"Strange such a difference there should be
'Twixt tweedledum and tweedledee."

If we raise a head of lettuce surpassing all that has been seen hereabouts, every good farmer that loves a salad would send for a little seed, and ask, as he took it, "How do you contrive to raise such monstrous heads? you must have some secret about it." But if my way were written down and printed, he would not touch it. "Poh, it's bookish!"

Now let us inquire in what States land is the best managed, yields the most with the least cost, where are the best sheep, the best cattle, the best hogs, the best wheat? It will be found to be in those States having the most agricultural papers.

What is there in agriculture that requires a man to be ignorant if he will be skillful? Or why may every other class of men learn by reading except the farmer? Mechanics have their journals; commercial men have their papers; religious men, theirs; politicians, theirs; there are magazines and journals for the arts, for science, for education, and *why not for that grand pursuit on which all these stand?* We really could never understand why farmers should not wish

to have their vocation on a level with others; why they should feel proud to have *no* paper, while every pursuit is fond of *having* one.

Those who are prejudiced against book-farming are either good farmers, misinformed of the design of agricultural papers, or poor farmers, who only treat this subject as they do all others, with blundering ignorance. First, the good farmers; there are in every county many industrious, hard-working men, who know that they cannot afford to risk anything upon wild experiments. They have a growing family to support, taxes to pay, lands perhaps on which purchase money is due, or they are straining every nerve to make their crops build a barn, that the barn may hold their crops. They suppose an agricultural paper to be stuffed full of wild fancies, expensive experiments, big stories made up by men who know of no farming except parlor-farming. They would, doubtless, be surprised to learn that ninety-nine parts in a hundred of the contents of agricultural papers are written by *hard-working practical farmers!* that the editor's business is not to foist absurd stories upon credulous readers, but to sift stories, to scrutinize accounts, to obtain whatever has been abundantly proved to be fact, and to reject all that is suspected to be mere fanciful theory. Such papers are designed to prevent imposition; to kill off pretenders by exposing them; to search out from practical men whatever they have found out, and to publish it for the benefit of their brethren all over the Union; to spread before the labouring classes such sound, well-approved scientific knowledge as shall throw light upon every operation of the farm, the orchard and the garden.

The other class who rail at book-farming ought to be excused, for they do not treat book-farming any worse than they do their own farming; indeed, not half so bad. They rate the paper with their tongue; but cruelly abuse their ground, for twelve months in the year, with both hands. I will draw the portrait of a genuine anti-book-farmer of this last sort.

He plows three inches deep, lest he should turn up the poison that, in his estimation, lies below; his wheat-land is plowed so as to keep as much water on it as possible; he sows two bushels to the acre and reaps ten, so that it takes a fifth of his crop to seed his ground; his corn-land has never any help from him, but bears just what it pleases, which is from thirty to thirty-five bushels by measurement, though he brags that it is fifty or sixty. His hogs, if not remarkable for fattening qualities, would beat old Eclipse at a quarter race; and were the man not prejudiced against deep plowing, his hogs would work his grounds better with their prodigious snouts than he does with his jack-knife plow. His meadow-lands yield him from three quarters of a ton to a whole ton of hay, which is regularly spoiled in curing, regularly left out for a month, and very irregularly stacked up, and left for the cattle to pull out at their pleasure, and half-eat and half-trampled underfoot. His horses would excite the avarice of an anatomist in search of osteological specimens, and returning from their range of pasture, they are walking herbariums, bearing specimens in their mane and tail of every weed that bears a bur or a cockle. But, O, the cows! If held up in a bright day to the sun, don't you think they would be semi-transparent? But he tells us that good milkers are always poor! His cows get what Providence sends them, and very little beside, except in winter, then they have a half-peck of corn on ears a foot long thrown to them, and they afford lively spectacles of animated corn and cob-crushers—never mind, they yield, on an average, three quarts of milk a-day! and that milk yields varieties of butter quite as astonishing.

His farm never grows any better, in many respects it gets annually worse. After ten years' work on a good soil, while his neighbours have grown rich, he is just where he started, only his house is dirtier, his fences more tottering, his soil poorer, his pride and his ignorance greater. And when, at last, he sells out to a Pennsylvanian that reads the *Farmer's Cabinet*, or to some New Yorker with his *Cultivator* packed up carefully, as if it were gold, or to a Yankee with his *New England Farmer*, he goes off to Missouri, thanking Heaven that *he's* not a book-farmer!

Unquestionably, there are two sides to this question, and both of them *extreme*, and therefore both of them deficient in science and in common sense. If men were made according to our notions, there should not be a silly one alive; but it is otherwise ordered, and there is no depart-

ment of human life in which we do not find the weak and foolish men. This is true of farming as much as of any other calling. But no one dreams of setting down the vocation of agriculture, because, like every other, it has had its proportion of stupid men.

Why then should agricultural *writers*, as a class, be summarily rejected because some of them are visionary? Are we not to be allowed our share of fools as well as every other department of life? We insist on our rights.

A book or a paper never proposes to take the place of a farmer's *judgment*. Not to read at all is bad enough; but to read, and swallow everything without reflection, or discrimination, this is even worse. Such a one is not a book-headed but a block-headed farmer. Papers are designed to *assist*. Those who read them must select, modify, and act according to their own native judgment. So used, papers answer a double purpose; they convey a great amount of valuable practical information, and then they stir up the reader to habits of thought; they make him more inquisitive, more observing, more reasoning, and, therefore, more reasonable.

Now, as to the contenss of agricultural papers, whose fault is it if they are not *practical?* Who are the practical men? who are daily conversant with just the things a cultivator most needs to know? who is stumbling upon difficulties, or discovering some escape from them? who is it that knows so much about gardens, orchards, farms, cattle, grains and grasses? Why, the very men *who won't write a word for the paper that they read*, and then complain that there is nothing *practical in it*. Yes, there is. There is practical evidence that men are more willing to be helped, than to help others; and also that men sometimes blame others for things of which they themselves are chiefly blameworthy.

Interesting to Wives.

As a general rule it is most economical to buy the best articles. The price is, of course, always a little higher, but good articles are best. It is a sacrifice of money to buy poor flour, meal, sugar, molasses, cheese, butter, lard, &c., to say nothing of the injurious effect upon the health.

Of West India sugar and molasses, the Santa Cruz and Porto Rico are considered the best. The Havanna is seldom clean. White sugar from Brazil is very good. Refined sugars usually contain the most saccharine substance, therefore, there is probably more economy in using crushed loaf, and granulated sugars than we should at first suppose.

Butter that is made in September and October is the best for winter use.

Lard should be hard and white; and that which is taken from a hog over a year old is the best.

Rich cheese feels soft under the pressure of the finger. That which is strong is neither good nor healthy. To keep one that is cut, tie it up in a bag that will not admit flies, and hang it in a cool dry place. If mould appears on it wipe it off with a dry cloth.

The best rice is large, and has a clear, fresh look. Old rice sometimes has little black insects inside the kernel.

The small white sago, is the best. The large brown kind has an earthy taste. These articles, and ground rice, tapioca, &c., should be kept covered.

The cracked cocoa-nut is the best, but that which is put up in pound papers is often very good.

Shells are apt to be musty. Try a quarter of a pound before buying a quantity.

To select nutmegs, pick them with a pin. If they are good the oil will instantly spread around the puncture.

Oranges and lemons keep best wrapped close in soft paper and laid in a drawer of linen.

When a cask of molasses is bought, draw off a few quarts, else the fermentation produced by moving it will burst the cask.

Bread and cake should be kept in a tin box or a stone jar.

Salt codfish should be kept in a dry place, where the odour of it will not affect the air of the house. The best kind is that which is called Dun, from the peculiar colour. Fish skin for clearing coffee, should be washed, dried, cut small, and kept in a paper bag.

Soft soap should be kept in a dry place in the cellar, and should not be used until six months old.

Bar soap should be cut in pieces of a convenient size, and left where it will become dry. It is well to keep it for several

weeks before using it, as it spends fast when it is new.

Cranberries will keep all winter in a firkin of water in the cellar.

Potatoes should be put in the cellar as soon as they are dug. Lying exposed to the sun turns them green and makes them watery. Some good house-keepers have sods laid over barrels of potatoes not in immediate use. To prevent them from sprouting in the spring, turn them out upon the cellar bottom.

To thaw frozen potatoes, put them in hot water. To thaw frozen apples, put them in cold water. Neither will keep well after being frozen.—*Eastern Farmer.*

Maxims for Married Women.

The unmarried women, says an exchange, who can read this without indignation, ought to be married:

Let every wife be persuaded that there are two ways of governing a family. The first is by the expression of that will which belongs to force; the second to the power of mildness, to which every strength will yield. One is the power of the husband; a wife should never employ any other arms than those of gentleness. When a woman accustoms herself to say "I will," she deserves to lose her empire.

Avoid contradicting your husband. When we smell a rose it is to imbue the sweets of odor; we look for everything amiable in woman. Whoever is often contradicted feels insensibly an aversion for the person who contradicts, which gains strength by time, and whatever be her good qualities, is not easily destroyed.

Occupy yourself only with household affairs, wait till your husband confides to you those of higher importance, and do not read lectures to him. Let your preaching be a good example, and practice virtue yourself to make him love it.

Command his attention by being always kind to him; never exact anything, and you will attain much; appear always flattered by the little he does for you, which will excite him to do more.

All men are vain; never wound his vanity, not even in the most trifling instances. A wife may have more sense than her husband but she should never seem to know it.

When a man gives wrong counsel, never feel that he has done so, but lead him by degrees to what is rational, with mildness and gentleness; when he is convinced, leave him to the merit of having found out what is just and reasonable.

When a husband is out of temper, behave obligingly to him; if he is abusive, never retort, and never prevail over him to humble him.

Choose well your friends, have but few, and be careful of following their advice in all matters.

Cherish neatness without luxury, and pleasure without excess; dress with taste, particularly with modesty; vary in the fashion of your dress, especially as regards colors. It gives a change to the ideas, and recalls pleasing recollections. Such things may appear trifling, but they have more importance than is imagined.

Never be curious to pry into you husband's concerns, but obtain his confidence. Always preserve economy, avoid being out of temper, and be careful not to scold; by this means he will find his house pleasanter than any other.

Seem always to obtain information from him, especially before company, though you may pass yourself for a simpleton.

Never forget that a wife owes all her importance to that of her husband. Leave him entirely master of his own actions, to go or come whenever he thinks fit. A wife ought to make her company amiable to her husband, that he will not be able to exist without it, then he will not seek for pleasure abroad, if she does not partake of it with him.—*Alexandria Gazette.*

Don't Scold.

Don't scold,—for it destroys affection. No one ever did, ever can, ever will, love an habitual fretter, fault-finder or scolder. Husbands, wives, children, relations or domestics, have no affection for peevish, fretful fault-finders. Few tears are shed over the graves of such. Persons of high moral principle may tolerate them, may bear with them, but they cannot love them any more than they can love the sting of nettles or the noise of musquitos. Many a man has been driven to the tavern and to dissipation, by a peevish, fretful wife; many a wife has been made miserable by a peevish, fretful husband.

Don't scold,—for it is the bane of domestic happiness. A fretful, peevish, complaining fault-finder in a family is like the continual chafing of an inflamed sore. Wo to

the man, woman or child, who is exposed to the influence of such a temper in another. Nine-tenths of all domestic trials and unhappiness spring from this source. Mrs. A. is of this temperament; she wonders that her husband is not more fond of her company; that her children give her so much trouble; that domestics do not like to work for her; that she cannot secure the good will of young people. The truth is, that she is peevish and fretful. Children fear, but do not love her. She never gained the affections of a young person, nor ever will—till she leaves off fretting and scolding.

Don't scold,—for it defeats the end of family government. Good family government requires the blending of authority with affection, so as to secure respect and love. Indeed, it is the great secret of managing young people. Your fretters and scolders may inspire fear, but they generally make two faults where they correct one. Scolding at a child, sneering at a child, taunting a child, as though it had no feelings, inspires dread and dislike, and fosters those very dispositions from which many of the faults of childhood proceed. Mr. B. and Mrs. C. are both of this class. Their children mind them—O, yes! they are *made* to mind. But how? By fretting and scolding. By severe treatment of their faults. The parents seem to watch for faults; they rarely give commands without a threat, and a long running fault-finding commentary. When they chide, it is not done in a dignified manner. They raise their voice; put on a cross look, threaten, strike, pinch ears, slap heads, cut short their allowance at meals, etc. Then the children cry, pout, sulk, and poor Mr. B. and C. have their work to do over again. And then Mrs. C. finds fault with her husband, or Mr. B. with his wife, because one will not fall in with the other's way, or chime with the chorus.

Don't scold,—for 'tis displeasing to God. It is evil, only evil, and that continually. David understood both human nature and the law of God; and he says, "Fret not thyself in anywise to do evil;" that is, never fret or scold, for it is always a sin. If you cannot speak without fretting or scolding, hold your tongue.

"Make yourself clearly acquainted with the rules of politeness and propriety, so that you may improve your manners."

The Japanese and Chinese.

The following is an extract of a letter from Richard H. Dana, jr., who has recently visited Japan:

A word more as to the contrast between the Chinese and the Japanese. It should not be given entirely in favor of the Japanese, as Oliphant gives it. These Chinese are more scholarly, more literary, more industrious, more peaceable and more decent. No where on earth is external decency more rigidly observed than in China. Not the sisters of the religious orders are more modestly attired than the women of China. Nothing could induce even the girls of the flower boats—perhaps as abandoned as any women in the world—to expose the neck or the arm in their dress, and the evening dress of a European lady is revolting to their ideas of propriety. Nowhere are industry and learning more honored than in China. The literati are the ruling order, the military are an inferior class; and every election and office is open to the successful scholar, under their competitive system, without the obstructions of rank or hereditary castes. The industry of China is infinitesimal, unceasing and universal. The Chinese are a nation of corn-traders, scholars and diplomatists. The Japanese, though by no means indolent, are less universally industrious, and there are more non-producing consumers among them. They are more violent, more intemperate in drink, and are shameless where the Chinese are scrupulous in the extreme; and, though they are generally taught to read and write, and excel the Chinese in some branches of the arts and sciences, scholarship has not the position and honors it has in China. On the other hand, while the Chinese are effeminate, luxurious and self-complacent, the Japanese are proud, manly and simple in their food and costume, and their government, though more exclusive and more bloody, is more vigorous and just, with less of corruption and peculation.

CHEAP FRUIT CAKE.—One cup sugar; 1 cup butter; ½ cup buttermilk; 1 teaspoon soda; 3 eggs; 1 cup raisins; 1 cup common currants. Chop the raisins and currants very fine.

POUND CAKE.—One pound butter; one of flour; one of sugar; and eight eggs; season with cloves, nutmeg or cinnamon.

The Bird that Sung in May.

A bird last spring came to my window shutter,
One lovely morning at the break of day;
And from his little throat did sweetly utter
A most melodious lay.

He had no language for his joyous passion,
No solemn measure, no artistic rhyme;
Yet no devoted minstrel e'er did fashion
Such perfect tune and time.

It seemed of thousand joys a thousand stories,
All gushing forth in one tumultuous tide;
A hallelujah for the morning glories
That bloomed on every side.

And with each canticle's voluptuous ending,
He sipped a dew-drop from the dripping pane;
Then heavenward his little bill extending,
Broke forth in song again.

I thought to emulate his wild emotion,
And learn thanksgiving from his tuneful tongue;
But human heart ne'er uttered such devotion,
Nor human lips such song.

At length he flew and left me in sorrow,
Lest I should hear those tender notes no more;
And though I early waked for him each morrow,
He came not nigh my door.

But once again, one silent summer even,
I met him hopping in the new-mown hay;
But he was mute, and looked not up to heaven—
The bird that sung in May.

Though now I hear from dawn to twilight hour
The hoarse wood-pecker and the noisy jay,
In vain I seek through leafless grove and bower
The bird that sung in May.

And such, methinks, are childhood's dawning pleasures.
They charm a moment and then fly away;
Through life we sigh and seek those missing treasures,
The birds that sung in May.

This little lesson, then, my friend, remember,
To seize each bright-winged blessing in its day;
And never hope to catch in cold December,
The bird that sung in May.

From the Ohio Farmer.

The Rose that Bloomed Up-Stairs.

A MOTHER'S STORY.

BY MRS H. L. BOSTWICK.

Beside my door a rose-tree grew,
And wide and high its branches threw,
Yet blossom never yielded;
I searched it oft with anxious eye,
But failed to look where, far on high,
The vines a window shielded.

One day, intent on household cares,
I oped a little room up-stairs,
Whose casement loosely closes;
My wee twin pets crept up beside—
Then Allie, starting, as she cried,
"Mamma! mamma! your roses!

In at the loosened sash they grew;
More beautiful they seemed to view
Than any out-door bloomers;
And day by day, in merry pairs,
My babes and I would steal up-stairs,
To greet the sweet new-comers.

When Autumn came—oh! time of gloom!—
My twins, my precious buds of bloom,
Slept in the grave's dark keeping;
But Allie sweetly wiped my eyes,
And gave caresses for my sighs,
And chid my bitter weeping.

Oh! for a child's blest faith, to feel
No doubting of the future's weal—
No haunting "ifs" and "may-bees."
"Don't cry, mamma," she lisped at prayers,
"Remember how your rose-tree bears—
I guess God 's got some nice 'up-stairs,'
Where we shall find the babies."

Flowers.

There is a legend, old as earth,
But beautiful and true,
Which tells us how the flowers had birth,
And whereforc came the dew.

When Evé—thro' Satan's sore deceit—
Touched the forbidden tree,
And tempted her "good man" to eat,
The Lord came angrily

And straightway turned from Eden's bowers
These first-born sinners forth,
Away from all its smiling flowers,
Upon the barren earth.

But pitying, ere to Heaven he passed,
His angles—brothers then—
O'er all the earth their footprints cast,
And hill, and vale, and glen

Sparked with flowers—earth's starry spheres—
And on they fled from view,
They strewed the flowers with pitying tears,
Which since have passed for dew.

And thus, though Paradise was lost
But first of human kind,
Thy children know, though sorely crossed,
God's love is left behind.